



Australian Government

MEA Aeroskills Training Package

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MEA Aeroskills Training Package

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Links

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MEA20415 Certificate II in Aeroskills

Modification History

Release 2 - Correction of errors to unit titles in packaging rules in Group B Electives.
Equivalent.

Qualification Description

This qualification applies to employees in aviation maintenance workshops who are required to perform repair and overhaul tasks on a limited range of aircraft electrical, hydraulic, pneumatic, electro-hydraulic and electro-pneumatic components, or who perform simple repairs on a limited range of structural components.

Units of competency that comprise this qualification are a mix of common units that apply to all technical employment streams covered by the MEA Aeroskills Training Package (core units) and technical stream units that are specific to a technical employment stream (elective units).

The qualification provides significant credits towards higher level Aeroskills Certificates.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA). Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA20415 Certificate II in Aeroskills, competency must be demonstrated in one of:

- Avionic: **Twelve (12)** units consisting of **eight (8)** core units plus **three (3)** units from elective Group A and **one (1)** unit from either Group B or Group C
- Mechanical: **Twelve (12)** units consisting of **eight (8)** core units plus **three (3)** units from elective Group B and **one (1)** unit from either of Groups A and C
- Structures: **Eleven (11)** units consisting of **eight (8)** core units plus **two (2)** units from elective Group C and **one (1)** unit from either of Groups A and B.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA117	Apply self in the aviation maintenance environment	

Unit code	Unit title	Prerequisites
MSAENV272B	Participate in environmentally sustainable work practices	

Elective units of competency

Group A

Unit code	Unit title	Prerequisites
MEA238	Perform routine removal and installation of miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA239	Fabricate aircraft electrical looms and harnesses	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA240	Use electrical test equipment to perform basic electrical tests	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

Group B

Unit code	Unit title	Prerequisites
MEA329	Maintain aircraft basic hydraulic and pneumatic components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA330	Maintain aircraft non-primary structural removable components or parts and internal fittings	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA331	Maintain aircraft gas turbine engine components or parts	MEA101, MEA103 MEA105, MEA107

		MEA108, MEA109
MEA332	Maintain aircraft mechanical components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA333	Maintain aircraft piston engine components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

Group C

Unit code	Unit title	Prerequisites
MEA406	Repair/modify aircraft non-primary structural sheet metal components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA407	Repair/modify aircraft non-primary structural non-metallic components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

Qualification Mapping Information

Release 2 - Correction of errors to unit titles in packaging rules in Group B Electives.
Equivalent

Supersedes and is equivalent to MEA20411 Certificate II in Aeroskills

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA20515 Certificate II in Aircraft Line Maintenance

Modification History

Release 1 - New qualification

Qualification Description

This qualification is applicable to employees of airlines and other operators of piston, jet and turbo-propeller aircraft and helicopters who are required to hold a Civil Aviation Safety Authority (CASA) A Licence to perform and certify a range of specified maintenance tasks that can be performed with the aircraft on a flight line or at the departure gate. On completion of the required maintenance tasks the individual is authorised to release the aircraft to service.

The qualification satisfies CASA requirements for the grant, under Civil Aviation Safety Regulation (CASR) Part 66 of an Aircraft Maintenance Engineer A Licence when:

- the skill and knowledge requirements align with CASA syllabus requirements described under 'Licensing' in the Companion Volume Implementation Guide
- training has been delivered in accordance with the requirements of CASR Part 147.
-

The units of competency that comprise this qualification consist of a mix of:

- common units that are applicable to all of the employment streams covered by the MEA Aeroskills Training Package or are of an administrative nature relating to the CASA A Licence
- a combination of Avionic, Mechanical and Structures Technical Stream units that apply to the range of tasks performed by the holders of CASA A Licences.

This qualification provides a number of credits towards higher level Aeroskills Certificates and towards the MEA50215 Diploma of Aeroskills (Mechanical) which is required for the grant of a CASA B1 Licence.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA20515 Certificate II in Aircraft Line Maintenance, competency must be demonstrated in **fifteen (15)** units of competency, as follows:

- **fourteen (14)** core units made up of common, imported and technical stream units

- **one (1)** unit from elective Group A chosen according to the CASA A Licence that is being sought.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA117	Apply self in the aviation maintenance environment	
MEA119	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance	All Certificate II units relevant to the applicable A Licence
MEA240	Use electrical test equipment to perform basic electrical tests	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA264	Remove and install aircraft electrical/avionic components during line maintenance	MEA265
MEA265	Remove and install general aircraft electrical hardware	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA344	Remove and install aircraft components	MEA101, MEA103

Unit code	Unit title	Prerequisites
		MEA105, MEA107 MEA108, MEA109
MEA418	Perform basic repair of aircraft internal fittings during line maintenance	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MSAENV272B	Participate in environmentally sustainable work practices	

Elective units of competency

Group A

Unit code	Unit title	Prerequisites	Unit applicability
MEA345	Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Mandatory where A1 Licence is sought
MEA346	Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Mandatory where A3 Licence is sought
MEA347	Perform scheduled line maintenance activities on piston engine fixed wing aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Mandatory where A2 Licence is sought
MEA348	Perform scheduled line maintenance activities on piston engine rotary wing aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Mandatory where A4 Licence is sought

Qualification Mapping Information

Supersedes and is equivalent to MEA20511 Certificate II in Aircraft Line Maintenance

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA20615 Certificate II in Aircraft Surface Finishing

Modification History

Release 2 - Correction of errors to unit titles in packaging rules in Group A Electives

Release 1 - New qualification

Qualification Description

This qualification is applicable to employees of Aircraft Maintenance Organisations (AMOs) or specialist aircraft surface finishing organisations who are involved in the stripping of old finishes and in the preparation of aircraft and aircraft component surfaces for the application of paint and other specialist surface finishes. A limited range of component removal and installation tasks related to surface finishing tasks may also be performed.

Units of competency that comprise this qualification are a mix of common units that are applicable to all employment streams at the Certificate II level, plus a number of structures technical stream units that relate to aircraft surface finishing and minor repairs, plus a mechanical technical stream unit that provides optional multi-skilling.

The qualification provides a significant number of credits towards surface finishing qualifications at Certificate III and IV levels. The common units also provide credit towards other Aeroskills qualifications and the elective units would count towards a MEA20415 Certificate II in Aeroskills.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA). Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA20615 Certificate II in Aircraft Surface Finishing competency must be demonstrated in **twelve (12)** or **thirteen (13)** units of competency, depending on the choice of specialist units. These units include:

- **eleven (11)** core units consisting of common, imported and technical stream units
- either elective Group A (**one (1)** unit) or Group B (**two (2)** units).

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA117	Apply self in the aviation maintenance environment	
MEA411	Remove surface coatings from aircraft or aircraft components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA412	Pre-treat aluminium alloy surfaces	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA413	Seal aircraft and aircraft component structural seams	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MSAENV272B	Participate in environmentally sustainable work practices	

Elective units of competency

Group A

Unit code	Unit title	Prerequisites
MEA330	Maintain aircraft non-primary structural removable components or parts and internal fittings	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

Group B

Unit code	Unit title	Prerequisites
MEA406	Repair/modify aircraft non-primary structural sheet metal components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA407	Repair/modify aircraft non-primary structural non-metallic components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

Qualification Mapping Information

Release 2 - Correction of error to unit title in Group A Electives. Equivalent.

Supersedes and is equivalent qualification MEA20611 Certificate II in Aircraft Surface Finishing

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA30115 Certificate III in Aircraft Surface Finishing

Modification History

Release 1 - New qualification

Qualification Description

This qualification is applicable to employees of aircraft maintenance organisations, or of specialist aircraft surface finishing organisations who are required to prepare the surfaces of aircraft and aircraft components for the application of surface finishes, apply paint, specialist finishes and decals or stencils. Also required is the application of aircraft registration markings, national markings and organisational logos.

The units of competency that comprise this qualification are a mix of:

- common units that apply to all Aeroskills specialist streams at Certificate III and IV levels
- structures technical stream units relating to aircraft surface finishing
- imported automotive units relating to the application of paint finishes.

This qualification fully articulates with the MEA40915 Certificate IV in Aircraft Surface Finishing and the common units provide a number of credits towards other Aeroskills qualifications at Certificate III and IV levels.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA). Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA30115 Certificate III in Aircraft Surface Finishing, competency must be demonstrated in **seventeen (17)** core units of competency. Units must be chosen as specified under the conditions set out below.

There are no elective units for this qualification.

Core units of competency

- Complete all **eight (8)** of the common and imported core units listed below.

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA118	Conduct self in the aviation maintenance environment	
MSAENV272B	Participate in environmentally sustainable work practices	

- Plus the **nine (9)** core technical stream and imported units listed below.

Unit code	Unit title	Prerequisites
AURVTP2003	Prepare spray painting materials and equipment	
AURVTP3012	Apply air dry and polyurethane enamel refinishing materials	
MEA411	Remove surface coatings from aircraft or aircraft components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA412	Pre-treat aluminium alloy surfaces	MEA101, MEA103 MEA105, MEA107

Unit code	Unit title	Prerequisites
		MEA108, MEA109
MEA413	Seal aircraft and aircraft component structural seams	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA414	Remove light corrosion from aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA415	Paint aircraft surfaces	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA416	Apply aircraft identification markings, graphics and decals	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA417	Apply specialty coatings to aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

Qualification Mapping Information

Supersedes and is equivalent to MEA30111 Certificate III in Aircraft Surface Finishing

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA30215 Certificate III in Aeroskills (Mechatronics)

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to individuals employed within the General Aviation industry sector on the maintenance of small aircraft who are not seeking direct progression to a Civil Aviation Safety Authority (CASA) B1.2 Aircraft Maintenance Engineer Licence limited to basic small aircraft maintenance. It may also be of use as a first Aeroskills qualification for individuals transitioning from an allied trade to employment on small aircraft maintenance.

Individuals who intend to seek the grant of a licence in the future should consider the requirements for the MEA41015 Certificate IV in Aeroskills (Mechatronics) when selecting elective units of competency for this qualification.

Depending on the choice of elective units this qualification articulates with the MEA41015 Certificate IV in Aeroskills (Mechatronics) and a number of units also provide credits towards other qualifications at Certificate IV and Diploma levels.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA30215 Certificate III in Aeroskills (Mechatronics), competency must be demonstrated in **twenty (20)** units of competency, as follows:

- **fifteen (15)** core units consisting of common, technical stream and imported units
- **five (5)** elective units drawn from the technical stream units listed in Group A while observing the unit selection guidelines.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	

MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA118	Conduct self in the aviation maintenance environment	
MEA148	Apply mathematics and physics in aviation maintenance	
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA301	Perform aircraft flight servicing	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA364	Maintain and/or repair small aircraft mechanical components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA369	Inspect and maintain structures and related components of non-pressurised small aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

MSAENV272B	Participate in environmentally sustainable work practices	Nil
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Elective units of competency

Group A

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA202	Remove and install basic aircraft electrical system components	MEA201	Required for electrical retractable undercarriage maintenance – do not take with MEA274
MEA210	Inspect, test and troubleshoot basic aircraft electrical systems and components	MEA202, MEA246	Required for electrical retractable undercarriage maintenance – do not take with MEA274
MEA274	Maintain basic light aircraft electrical systems and components	MEA246	Required for 100 hourly inspection on basic light aircraft or helicopters
MEA275	Maintain basic light aircraft instrument systems	MEA246	Required for 100 hourly inspection on basic light aircraft or helicopters
MEA276	Maintain basic light aircraft communication and radio navigation systems	MEA246	Required for 100 hourly inspection on basic light aircraft or helicopters
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Required for hydraulic retractable undercarriage maintenance

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA304	Remove and install non-pressurised aircraft structural and non-structural components	MEA302	Do not take with MEA317 – MEA363 provides credits towards this unit
MEA306	Remove and install engines and engine system components	MEA302	Applicable to piston and gas turbine engines
MEA307	Remove and install propeller systems and components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Required for variable pitch propellers
MEA308	Remove and install rotary wing rotor and flight control system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Required for helicopters with powered flight controls – do not take with MEA352
MEA309	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components	MEA302	Required for hydraulic retractable undercarriage maintenance
MEA313	Inspect, test and troubleshoot piston engine systems and components	MEA306	Required for supercharged and turbocharged engines
MEA314	Inspect, test and troubleshoot gas turbine engine systems and components	MEA306	Required for gas turbine engines
MEA315	Inspect, test and troubleshoot propeller systems and components	MEA307	Required for variable pitch propellers
MEA316	Inspect, test and troubleshoot rotary wing rotor and control systems and components	MEA308	Required for helicopters with powered flight controls – count as 2 units - do not take with MEA352

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA351	Maintain airframe systems of basic light fixed wing aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Required for 100 hourly inspection on basic light aircraft
MEA352	Maintain basic rotary wing aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Required for 100 hourly inspection on basic helicopters
MEA353	Maintain basic light aircraft engines and propellers	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Required for 100 hourly inspection on basic light aircraft or helicopters
MEA354	Maintain light aircraft pneumatic systems	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA355	Maintain light aircraft air cycle air conditioning systems	MEA201, MEA246	
MEA356	Maintain light piston engine aircraft pressurisation systems	MEA201, MEA246	
MEA357	Inspect, test and repair aircraft fabric surfaces	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA359	Inspect and repair aircraft wooden structures	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA360	Maintain aircraft diesel engines	MEA353	
MEA361	Maintain aircraft two stroke petrol engines	MEA353	
MEA362	Maintain aircraft vapour cycle air conditioning systems	MEA201, MEA246	
MEA367	Repair/modify aircraft	MEA369	Do not take with

Unit code	Unit title	Prerequisites	Unit selection guidelines
	composite structure using cold bonding		MEA405
MEA370	Repair the structure of non-pressurised small aircraft	MEA369	
MEA371	Perform major repairs and modifications to small aircraft metal structure	MEA369, MEA370	
MEA405	Repair/modify aircraft composite material structure/components	MEA401 Note that MEA369 is equivalent to MEA401	Required for repairs to composite primary and secondary structure

Qualification Mapping Information

Supersedes and is equivalent to MEA30211 Certificate III in Aeroskills (Mechatronics)

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA30315 Certificate III in Aircraft Life Support and Furnishing

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to members of the Australian Defence Force (ADF) and to employees of Aircraft Maintenance Organisations (AMOs) who are maintaining aircraft and personal life support equipment and aircraft furnishings.

The qualification consists of a number of common units plus mandatory and elective technical stream units, including a number of imported units dealing with explosive ordnance (pyrotechnics) safety and inspection, and with sewing, trimming and use of fabric adhesives.

The qualification articulates with MEA41115 Certificate IV in Aircraft Life Support and Furnishing and the common units and the elective Avionic, Mechanical and Structures Technical Stream units provide a number of credits towards other Aeroskills Certificates at Certificate II, III and IV levels.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and the Civil Aviation Safety Authority (CASA). Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA30315 Certificate III in Aircraft Life Support and Furnishing, competency must be demonstrated in **twenty-one (21)** units of competency, as follows:

- **nine (9)** core units consisting of common and imported units
- **twelve (12)** elective units (chosen in accordance with the unit selection guidelines in Column 4) from the technical stream and imported units in Group A.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA118	Conduct self in the aviation maintenance environment	
MEM12001B	Use comparison and basic measuring devices	
MSAENV272B	Participate in environmentally sustainable work practices	

Elective units of competency

Group A

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA240	Use electrical test equipment to perform basic electrical tests	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA301	Perform aircraft flight servicing	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA303	Remove and install aircraft pneumatic system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA304	Remove and install non-pressurised aircraft structural and non-structural components	MEA302	Do not take with MEA317
MEA317	Remove and install pressurised aircraft structural and non-structural components	MEA302, MEA303	Do not take with MEA304
MEA411	Remove surface coatings from aircraft or aircraft components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA412	Pre-treat aluminium alloy surfaces	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA414	Remove light corrosion from aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Do not take with MEA419
MEA416	Apply aircraft identification markings, graphics and decals	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA419	Inspect and repair/modify aircraft cabin/cockpit non-primary structure components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Do not take with MEA414
MEA501	Maintain and fit anti-G suits	MEA101, MEA103	

Unit code	Unit title	Prerequisites	Unit selection guidelines
		MEA105, MEA107 MEA108, MEA109 MEA118, MEA511 MSFSF2002	
MEA502	Maintain and fit helmets	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118, MEA240	
MEA503	Maintain and fit immersion suits	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118 LMTTF2008A	
MEA504	Maintain and fit oxygen masks	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118, MEA240	
MEA505	Maintain and pack parachutes	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118, MEA511 MSFSF2002	
MEA507	Maintain, pack and fit survival inflatable buoyancy vests	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118	
MEA508	Maintain, install and remove restraint systems	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118, MEA511 MSFSF2002	
MEA509	Manufacture, repair and alter	MEA101, MEA103	

Unit code	Unit title	Prerequisites	Unit selection guidelines
	aircraft related fabric components	MEA105, MEA107 MEA108, MEA109 MEA118, MEA511 MSFSF2002	
MEA510	Maintain seat and pod electrical and electronic systems	MEA240	
MEA511	Operate and maintain sewing machines and overlockers		
MEA513	Maintain and pack survival inflatable life rafts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118	
MEA514	Maintain and pack escape slides	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118	
AURVTT2004	Trim vehicle components		Do not take with MSFUP3012
AURVTT2005	Select and apply trim and fabric materials		
AURVTT2006	Select and apply trim and fabric adhesives		Do not take with LMTTF2008A
MSFSF2001	Cut single layer fabrics		
MSFSF2002	Machine sew materials		
MSFUP3012	Apply marine sewing and installation techniques		Do not take with AURVTT2004
LMTTF2008A	Use adhesives		Do not take with AURVTT2006
DEFEO101D	Work safely with explosive ordnance		

Unit code	Unit title	Prerequisites	Unit selection guidelines
DEFEO301D	Package ammunition		
DEFEO302D	Unpackage ammunition		
DEFEO501D	Conduct explosive ordnance inspection		

Qualification Mapping Information

Supersedes and is equivalent to MEA30311 Certificate III in Aircraft Life Support and Furnishing

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA40615 Certificate IV in Aeroskills (Avionics)

Modification History

Release 2 - Correction to error of unit title in Group A (Aircraft Maintenance Stream)
MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components.

Qualification Description

This qualification applies to employees of Continuing Airworthiness Management Organisations (CAMOs) or to members of the Australian Defence Force (ADF) who perform scheduled inspections, fault diagnosis and repair, and modification of aircraft electrical, instrument and radio systems and system components.

The qualification defines the exit from an apprenticeship and may apply to either aircraft maintenance performed on flight lines/ramps and in hangars, or to avionic component repair and overhaul performed in workshops. These outcomes are defined in two streams:

- aircraft maintenance stream
- component maintenance workshop stream.

The qualification consists of:

- common units that apply to all Aeroskills specialist streams at Certificate III and IV levels
- avionic technical stream units relating to either aircraft avionic system and component maintenance or to component repair and overhaul
- one mechanical technical stream unit that is applicable to the aircraft maintenance stream
- one imported unit that is applicable to the aircraft maintenance stream.

Because of the wide application of this qualification there is considerable flexibility in the selection of technical stream units and individuals should be mindful of their future career aspirations when selecting units for, in particular, the aircraft maintenance stream. Provided that the correct elective units are selected, the qualification articulates with the Diploma of Aeroskills (Avionics) which qualifies individuals for the grant by the Civil Aviation Safety Authority (CASA) of a B2 Aircraft Maintenance Engineer Licence.

The qualification also provides credits towards the MEA50315 Diploma of Aviation Maintenance Management (Avionics) and the MEA60115 Advanced Diploma of Aviation Maintenance Management (Avionics).

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA40615 Certificate IV in Aeroskills (Avionics) competency must be demonstrated in:

Aircraft Maintenance Stream

- **twelve (12)** core units consisting of common, imported and some avionic technical stream units
- **thirteen (13)** elective technical stream units chosen from Group A
- Total: **twenty-five (25)** units

OR

Component Maintenance Workshop Stream

- **thirteen (13)** core units consisting of common, imported and avionic technical stream units
- **three (3)** elective technical stream units chosen from Group B
- Total: **sixteen (16)** units

Core units of competency (Aircraft Maintenance Stream)

- Complete all **twelve (12)** mandatory common, technical stream and imported units listed below.

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108

Unit code	Unit title	Prerequisites
MEA118	Conduct self in the aviation maintenance environment	
MEA148	Apply mathematics and physics in aviation maintenance	
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MSAENV272B	Participate in environmentally sustainable work practices	

Core units of competency (Component Maintenance Workshop Stream)

- Complete all **thirteen (13)** mandatory common, technical stream and imported units listed below.

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108

Unit code	Unit title	Prerequisites
MEA118	Conduct self in the aviation maintenance environment	
MEA148	Apply mathematics and physics in aviation maintenance	
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA261	Use electronic test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MSAENV272B	Participate in environmentally sustainable work practices	

Elective units of competency

Group A (Aircraft Maintenance Stream)

- Choose **thirteen (13)** of the technical stream units listed below while observing the unit selection guidelines in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA202	Remove and install basic aircraft electrical system components	MEA201	Do not take with MEA203
MEA203	Remove and install advanced aircraft electrical system components	MEA201	Do not take with MEA202
MEA204	Remove and install basic aircraft instrument system	MEA201	Do not take with

Unit code	Unit title	Prerequisites	Unit selection guidelines
	components		MEA205
MEA205	Remove and install advanced aircraft instrument system components	MEA201	Do not take with MEA204
MEA206	Remove and install aircraft basic radio communication and navigation system components	MEA201	Elective
MEA207	Remove and install aircraft electronic system components	MEA201	Elective
MEA208	Remove and install aircraft pressurisation control system components	MEA201	Elective
MEA209	Remove and install aircraft oxygen system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
MEA210	Inspect, test and troubleshoot basic aircraft electrical systems and components	MEA202, MEA246	Do not take with MEA211 or with MEA223 and MEA227
MEA211	Inspect, test and troubleshoot advanced aircraft electrical systems and components	MEA203, MEA246	Do not take with MEA210 or with MEA223 and MEA227
MEA212	Inspect, test and troubleshoot basic aircraft instrument systems and components	MEA204, MEA246	Do not take with MEA213 or with MEA224 and MEA228
MEA213	Inspect, test and troubleshoot advanced aircraft instrument systems and components	MEA205, MEA246	Do not take with MEA212 or with MEA224 and MEA228
MEA214	Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components	MEA206, MEA246	Do not take with MEA226 and MEA229

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA215	Inspect, test and troubleshoot advanced aircraft communications systems and components	MEA206, MEA246	Do not take with MEA226 and MEA229
MEA216	Inspect, test and troubleshoot instrument landing systems and components	MEA206, MEA207 MEA246	Do not take with MEA226 and MEA229
MEA217	Inspect, test and troubleshoot fixed wing autopilot systems and components	MEA207, MEA246	Take instead of MEA225 and MEA230 if only maintaining 3 axis autopilot system
MEA218	Inspect, test and troubleshoot rotary wing autopilot systems and components	MEA207, MEA246	Take instead of MEA231 if only maintaining an autopilot system
MEA219	Inspect, test and troubleshoot aircraft pressurisation control systems and components	MEA208, MEA246	Do not take with MEA224 and MEA228
MEA220	Inspect, test and troubleshoot aircraft primary radar systems and components	MEA207, MEA246	Do not take with MEA226 and MEA232
MEA221	Inspect, test and troubleshoot aircraft secondary radar systems and components	MEA207, MEA246	Do not take with MEA226 and MEA232
MEA222	Inspect, test and troubleshoot aircraft oxygen systems and components	MEA209	Elective
MEA223	Inspect aircraft electrical systems and components	MEA203, MEA246	Do not take with MEA210 or MEA211
MEA224	Inspect aircraft instrument systems and components	MEA205, MEA246	Do not take with MEA212 or MEA213
MEA225	Inspect fixed wing aircraft automatic flight control systems	MEA207, MEA246	Do not take with

Unit code	Unit title	Prerequisites	Unit selection guidelines
	and components		MEA217
MEA226	Inspect aircraft electronic systems and components	MEA207, MEA246	Do not take with MEA213, MEA214 or MEA215
MEA227	Test and troubleshoot aircraft electrical systems and components	MEA223	Do not take with MEA211
MEA228	Test and troubleshoot aircraft instrument systems and components	MEA224, MEA226	Do not take with MEA212 or MEA213
MEA229	Test and troubleshoot aircraft radio frequency navigation and communications systems and components	MEA226	Do not take with MEA214, MEA215 or MEA216
MEA230	Test and troubleshoot fixed wing aircraft automatic flight control systems and components	MEA225, MEA246	Do not take with MEA217
MEA231	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components	MEA207, MEA246	Do not take with MEA218
MEA232	Test and troubleshoot aircraft pulse systems and components	MEA226, MEA246	Do not take with MEA220 or MEA221
MEA233	Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components	MEA207, MEA246	Do not take with MEA226 and MEA228
MEA234	Inspect, test and troubleshoot aircraft global navigation systems and components	MEA206, MEA207 MEA246	Do not take with MEA226 and MEA229
MEA261	Use electronic test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA262	Modify/repair single layer printed circuit boards	MEA260, MEA261	Do not take with MEA263
MEA263	Modify/repair multi-layer printed circuit boards	MEA260, MEA261	Do not take with MEA262
MEA266	Terminate and repair aircraft optical fibre cable		Elective
MEA278	Inspect, test and troubleshoot instrument display systems and components	MEA207, MEA246	Do not take with MEA226, MEA228
MEA279	Inspect, test and troubleshoot full authority digital engine control systems	MEA207, MEA246	Do not take with MEA230
MEA280	Inspect, test and troubleshoot flight management systems and components	MEA207, MEA246	Elective
MEA301	Perform aircraft flight servicing	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
AVIF3016A	Marshal aircraft		Elective

Group B (Component Maintenance Workshop Stream)

- Choose at least **three (3)** of the Avionic technical stream units listed below while observing the unit selection guidelines in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA252	Test, align and troubleshoot synchro and servo system components	MEA201, MEA260 MEA261	Elective
MEA262	Modify/repair single layer printed circuit boards	MEA260, MEA261	Do not take with MEA263
MEA263	Modify/repair multi-layer	MEA260, MEA261	Do not take with

Unit code	Unit title	Prerequisites	Unit selection guidelines
	printed circuit boards		MEA262
MEA266	Terminate and repair aircraft optical fibre cable		Elective
MEA282	Repair or overhaul aircraft pulse system components	MEA260, MEA261	Elective
MEA283	Repair or overhaul aircraft display, control and distribution system components	MEA260, MEA261	Elective
MEA284	Repair or overhaul aircraft instrument system components	MEA260, MEA261	Elective
MEA285	Repair or overhaul aircraft radio frequency communication and navigation system components	MEA260, MEA261	Elective
MEA286	Repair or overhaul aircraft electrical/electro-mechanical components	MEA201, MEA260	Elective
MEA287	Repair or overhaul aircraft oxygen system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
MEA288	Repair or overhaul aircraft audio and visual systems and reproducers	MEA260, MEA261	Elective

Qualification Mapping Information

Release 2 - Correction of error to unit title MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components. Equivalent.

Supersedes and is equivalent to MEA40611 Certificate IV in Aeroskills (Avionics)

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA40715 Certificate IV in Aeroskills (Mechanical)

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to employees of Civil Aviation Maintenance Organisations (AMOs) or to members of the Australian Defence Force (ADF) who perform scheduled inspections, fault diagnosis and repair, and modification of airframes and airframe mechanical, hydraulic and pneumatic systems and components, and of aircraft engines and (where applicable) propellers.

The qualification defines the exit from an apprenticeship and may apply to either aircraft maintenance performed on flight lines/ramps and in hangars, or to airframe and engine component repair and overhaul performed in workshops. These outcomes are defined in two streams:

- aircraft maintenance stream
- component maintenance workshop stream.

The qualification consists of:

- common units that apply to all Aeroskills specialist streams at AQF Certificate III and IV levels
- mechanical and structures technical stream units relating to airframe and engine system and component maintenance
- mechanical technical stream units and a small number of avionic stream units that are applicable to the aircraft component maintenance workshop stream.

Because of the wide application of this qualification there is considerable flexibility in the selection of technical stream units and individuals should be mindful of their future career aspirations when selecting units for, in particular, the aircraft maintenance stream. Provided that the correct elective units are selected, the qualification articulates with the MEA50215 Diploma of Aeroskills (Mechanical) which qualifies individuals for the grant by Civil Aviation Safety Authority (CASA) of a B1 Aircraft Maintenance Engineer Licence.

The qualification also provides credit towards the MEA50415 Diploma of Aviation Maintenance Management (Mechanical) and the MEA60215 Advanced Diploma of Aviation Maintenance Management (Mechanical).

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA40715 Certificate IV in Aeroskills (Mechanical), competency must be demonstrated in:

Aircraft Maintenance Stream

- Core common and imported units: **eight (8)** units
- Elective technical stream units from Group A: **thirteen (13)** units
- Total: **twenty-one (21)** units.

OR

Component Maintenance Workshop Stream

- Core common and imported units: **eight (8)** units
- Elective technical stream units from Groups B and C: **six (6)** units
- Total: **fourteen (14)** units.

Core units of competency (common to both streams)

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA118	Conduct self in the aviation maintenance environment	

Unit code	Unit title	Prerequisites
MSAENV272B	Participate in environmentally sustainable work practices	

Elective units of competency

Group A (Aircraft Maintenance Stream)

- Choose **thirteen (13)** of the elective mechanical and structures technical stream units listed below while observing the unit selection guidelines in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260	
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA301	Perform aircraft flight servicing	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA303	Remove and install aircraft pneumatic system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA304	Remove and install non-pressurised aircraft structural and non-structural components	MEA302	Do not take with MEA317

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA305	Remove and install aircraft fixed wing flight control system components	MEA302	
MEA306	Remove and install engines and engine system components	MEA302	
MEA307	Remove and install propeller systems and components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA308	Remove and install rotary wing rotor and flight control system components	MEA302	Alternate to both MEA305 and MEA307
MEA309	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components	MEA302	Do not take with MEA318 and MEA320
MEA310	Inspect, test and troubleshoot aircraft pneumatic systems and components	MEA303	Do not take with MEA318 and MEA320
MEA312	Inspect, test and troubleshoot aircraft fixed wing flight control systems and components	MEA305	Do not take with MEA318C and MEA321
MEA313	Inspect, test and troubleshoot piston engine systems and components	MEA306	
MEA314	Inspect, test and troubleshoot gas turbine engine systems and components	MEA306	Do not take with MEA319 and MEA322
MEA315	Inspect, test and troubleshoot propeller systems and components	MEA307	
MEA316	Inspect, test and troubleshoot rotary wing rotor and control systems and components	MEA308	Alternative to both of MEA312 and MEA315

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA317	Remove and install pressurised aircraft structural and non-structural components	MEA302 MEA303	Do not take with MEA304
MEA318	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components	MEA302, MEA303 MEA305	Do not take with MEA309 or MEA310
MEA319	Inspect gas turbine engine systems and components	MEA306	Do not take with MEA314
MEA320	Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components	MEA318	Do not take with MEA309 or MEA310
MEA321	Test and troubleshoot aircraft fixed wing flight control systems and components	MEA318	Do not take with MEA312
MEA322	Test and troubleshoot gas turbine engine systems and components	MEA319	Do not take with MEA314
MEA327	Fabricate and/or repair aircraft mechanical components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Do not take with MEA328
MEA328	Maintain and/or repair aircraft mechanical components or parts	MEA302, MEA303	Do not take with MEA327
MEA339	Inspect, repair and maintain aircraft structures	MEA304 or MEA317	Do not take with MEA401 or MEA410
MEA362	Maintain aircraft vapour cycle air conditioning systems	MEA201, MEA246	
MEA366	Perform borescope inspections	MEA313 or MEA314 or MEA322 or MEA388	Additional unit where CASA borescope inspection

Unit code	Unit title	Prerequisites	Unit selection guidelines
			authority required
MEA401	Inspect aircraft structures	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Do not take with MEA311 or MEA339
MEA410	Maintain aircraft structure/components	MEA401	Do not take with MEA339
AVIF3016A	Marshal aircraft		

Groups B and C (Component Workshop Stream)

- Choose at least **three (3)** of the elective technical stream units listed in Group B and make up to a total of **six (6)** units with units from Group C.

Group B

Unit code	Unit title	Prerequisites
MEA380	Repair and/or overhaul aircraft hydraulic system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA381	Repair and/or overhaul aircraft pneumatic system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA382	Repair and/or overhaul aircraft fuel system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA383	Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA384	Repair and/or overhaul gas turbine engine combustion section components and/or modules	MEA101, MEA103 MEA105, MEA107

		MEA108, MEA109
MEA385	Repair and/or overhaul gas turbine engine turbine and exhaust section components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA386	Repair and/or overhaul gas turbine engine ancillary section components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA387	Test gas turbine engines and engine modules after overhaul or repair	MEA383, MEA384 MEA385, MEA386
MEA389	Repair and/or overhaul propellers	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA390	Repair and/or overhaul rotary wing dynamic components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA391	Repair and/or overhaul aircraft mechanical system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA392	Disassemble aircraft piston engines	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA393	Repair and/or overhaul aircraft piston engine cylinder assembly components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA394	Repair and/or overhaul aircraft piston engine crankcase assembly components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA395	Reassemble aircraft piston engines	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

MEA396	Assemble aircraft piston engine quick engine change unit	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA397	Test aircraft piston engines after repair or overhaul	MEA392, MEA393 MEA394, MEA395 MEA396

Group C

Unit code	Unit title	Prerequisites
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA368	Shot peen aircraft components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEM24002B	Perform penetrant testing	MEM18001C (Note that MEA109 is equivalent) MEM24012C
MEM24004B	Perform magnetic particle testing	MEM18001C (Note that MEA109 is equivalent) MEM24012C
MEM24012C	Apply metallurgy principles	

Qualification Mapping Information

Supersedes and is equivalent to MEA40711 Certificate IV in Aeroskills (Mechanical)

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA40915 Certificate IV in Aircraft Surface Finishing

Modification History

Release 1 - New qualification

Qualification Description

The qualification applies to employees of aircraft repair and overhaul organisations or members of the Australian Defence Force (ADF) engaged in either the supervision of aircraft surface finishing activities or working in an environment where a significant degree of multi-skilling is required in component removal and installation and/or the performance of a specified range of repair tasks.

The qualification consists of:

- common and imported units that apply to all Aeroskills specialist streams at Certificate III and IV levels
- mandatory surface finishing technical stream and imported units that also apply at Certificate III level
- elective units to be selected according to employment need from listed common units, mechanical and structures technical stream units and an imported unit.

The qualification also provides credits towards the MEA50415 Diploma of Aviation Maintenance Management (Mechanical) and the MEA60215 Advanced Diploma of Aviation Maintenance Management (Mechanical). A limited number of credits are also provided towards the MEA50215 Diploma of Aeroskills (Mechanical).

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and the Civil Aviation Safety Authority (CASA). Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA40915 Certificate IV in Aircraft Surface Finishing, competency must be demonstrated in **twenty-one (21)** units of competency, as follows:

- **seventeen (17)** core units consisting of common, technical stream and imported units
- **four (4)** elective units chosen from the technical stream and imported units in Group A.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA118	Conduct self in the aviation maintenance environment	
MEA411	Remove surface coatings from aircraft or aircraft components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA412	Pre-treat aluminium alloy surfaces	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA413	Seal aircraft and aircraft component structural seams	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA414	Remove light corrosion from aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA415	Paint aircraft surfaces	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

Unit code	Unit title	Prerequisites
		AURVTP2003 AURVTP3012
MEA416	Apply aircraft identification markings, graphics and decals	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA417	Apply specialty coatings to aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
AURVTP2003	Prepare spray painting materials and equipment	
AURVTP3012	Apply air dry and polyurethane enamel refinishing materials	
MSAENV472B	Implement and monitor environmentally sustainable work practices	

Elective units of competency

Group A

- Complete at least **four (4)** of the following units selected in accordance with the unit selection guidelines in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA113	Supervise civil aircraft maintenance activities and manage human resources in the workplace	Completion of all applicable Certificate IV units	
MEA116	Apply work health and safety procedures at supervisor level in aviation maintenance		Must be taken if MEA113 or MEA140 selected
MEA140	Supervise maintenance teams and perform maintenance quality inspections	Appointment as an Independent Inspector or Maintenance Quality	(this unit applicable to the ADF regulatory environment)

Unit code	Unit title	Prerequisites	Unit selection guidelines
		Inspector	
MEA240	Use electrical test equipment to perform basic electrical tests		
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Take with MEA305
MEA305	Remove and install aircraft fixed wing flight control system components	MEA302	
MEA405	Repair/modify aircraft composite material structure/components	MEA401	

Qualification Mapping Information

Supersedes and is equivalent to MEA40911 Certificate IV in Aircraft Surface Finishing

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA41015 Certificate IV in Aeroskills (Mechatronics)

Modification History

Release 2 - Qualification Description for MEA41015 revised to comply with CASA licensing requirements. No change to outcomes.

Release 1 - New qualification

Qualification Description

This qualification was aligned with the proposed Civil Aviation Safety Regulation (CASR) Part 66 Manual of Standards (MOS) that was to introduce a new small aircraft licensing system in July 2016. However, CASA decided to hold the revised MOS pending a full review of CASR Part 66 which is intended to take about two years to complete. Until CASA decides on the final form of small aircraft licensing it will not be possible to use this qualification as a pathway to grant of licence.

Until the CASA review is finalised the qualification can be used for small aircraft maintenance apprenticeships and will provide most of the knowledge required for the Basic Examinations which will continue to be the avenue to licensing for small aircraft maintenance.

The qualification applies to individuals involved in the maintenance of small aircraft within the General Aviation industry sector and is not a pathway to the grant of a B1 or B2 Licence for regular public transport aircraft maintained by a Civil Aviation Safety Regulation (CASR) Part 145 Maintenance Repair Organisation (MRO). The pathways to these licences are the MEA50215 Diploma of Aeroskills (Mechanical) for the B1 or the MEA50115 Diploma of Aeroskills (Avionics) for the B2. A number of units in this qualification would provide credits towards those qualifications and towards other qualifications at Certificate IV, Diploma and Advanced Diploma levels.

More information regarding the operation of the MEA Aeroskills Training Package in licence-related areas during the CASR Part 66 review can be found in the Companion Volume –Interface with CASA Licensing Requirements.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA41015 Certificate IV in Aeroskills (Mechatronics) competency must be demonstrated in **thirty (30)** units, as follows:

- **seventeen (17)** core common, technical stream and imported units that are applicable to all B1 and B2 Licences that are limited to release to service of basic small aircraft
- **thirteen (13)** elective Group A technical stream units where a limited B1.1 Licence is sought
- **ten (10)** elective Group B technical stream units where a limited B1.2 Licence is sought
- **eleven (11)** elective Group C technical stream units where a limited B1.3 Licence is sought
- **ten (10)** elective Group D technical stream units where a limited B1.4 Licence is sought
- **nine (9)** elective Group E technical stream units where a limited B2 Licence is sought
- elective Group F technical stream units chosen according to the requirements of the aircraft types being maintained to bring the total unit count to **thirty (30)** units.

Core units of competency

- All **seventeen (17)** units must be taken if a B1 or B2 Licence applicable to basic small aircraft maintenance is being sought.

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA111	Perform administrative processes to prepare for certification of civil aircraft maintenance	All applicable Certificate IV units

MEA112	Plan and implement civil aircraft maintenance activities	All applicable Certificate IV units
MEA113	Supervise civil aircraft maintenance activities and manage human resources in the workplace	All applicable Certificate IV units
MEA116	Apply work health and safety procedures at supervisor level in aviation maintenance	
MEA118	Conduct self in the aviation maintenance environment	
MEA148	Apply mathematics and physics in aviation maintenance	
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA301	Perform aircraft flight servicing	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MSAENV472B	Implement and monitor environmentally sustainable work practices	

Elective units of competency

Group A

- All **thirteen (13)** units must be taken if a B1.1 Licence applicable to basic small aircraft maintenance is being sought.

Unit code	Unit title	Prerequisites
MEA274	Maintain basic light aircraft electrical systems and components	MEA246

MEA275	Maintain basic light aircraft instrument systems and components	MEA246
MEA276	Maintain basic light aircraft communication and radio navigation systems and components	MEA246
MEA306	Remove and install engines and engine system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA307	Remove and install propeller systems and components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA314	Inspect, test and troubleshoot gas turbine engine systems and components	MEA306
MEA315	Inspect, test and troubleshoot propeller systems and components	MEA307
MEA351	Maintain airframe systems of basic light fixed wing aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA364	Maintain and/or repair small aircraft mechanical components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications	All Cert IV units listed for applicable licence
MEA369	Inspect and maintain structure and related components of non-pressurised small aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA370	Repair the structure of non-pressurised small aircraft	MEA369
MEA372	Perform mechanical elementary maintenance	MEA301

Group B

- All ten (10) units must be taken if a B1.2 Licence applicable to basic small aircraft maintenance is being sought.

Unit code	Unit title	Prerequisites
MEA274	Maintain basic light aircraft electrical systems and components	MEA246
MEA275	Maintain basic light aircraft instrument systems and components	MEA246
MEA276	Maintain basic light aircraft communication and radio navigation systems and components	MEA246
MEA351	Maintain airframe systems of basic light fixed wing aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA353	Maintain basic light aircraft engines and propellers	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA364	Maintain and/or repair small aircraft mechanical components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications	All Cert IV units listed for applicable licence
MEA369	Inspect and maintain structure and related components of non-pressurised small aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA370	Repair the structure of non-pressurised small aircraft	MEA369
MEA372	Perform mechanical elementary maintenance	MEA301

Group C

- All **eleven (11)** units must be taken if a B1.3 Licence applicable to basic small aircraft maintenance is being sought.

Unit code	Unit title	Prerequisites
MEA274	Maintain basic light aircraft electrical systems and components	MEA246

MEA275	Maintain basic light aircraft instrument systems and components	MEA246
MEA276	Maintain basic light aircraft communication and radio navigation systems and components	MEA246
MEA306	Remove and install engines and engine system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA314	Inspect, test and troubleshoot gas turbine engine systems and components	MEA306
MEA352	Maintain basic rotary wing aircraft systems	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA364	Maintain and/or repair small aircraft mechanical components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications	All Cert IV units listed for applicable licence
MEA369	Inspect and maintain structure and related components of non-pressurised small aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA370	Repair the structure of non-pressurised small aircraft	MEA369
MEA372	Perform mechanical elementary maintenance	MEA301

Group D

- All **ten (10)** units must be taken if a B1.4 Licence applicable to basic small aircraft maintenance is being sought.

Unit code	Unit title	Prerequisites
MEA274	Maintain basic light aircraft electrical systems and components	MEA246
MEA275	Maintain basic light aircraft instrument systems and components	MEA246

MEA276	Maintain basic light aircraft communication and radio navigation systems and components	MEA246
MEA352	Maintain basic rotary wing aircraft systems	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA353	Maintain basic light aircraft engines and propellers	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA364	Maintain and/or repair small aircraft mechanical components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications	All Cert IV units listed for applicable licence
MEA369	Inspect and maintain structure and related components of non-pressurised small aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA370	Repair the structure of non-pressurised small aircraft	MEA369
MEA372	Perform mechanical elementary maintenance	MEA301

Group E

- All **nine (9)** units must be taken if a B2 Licence applicable to basic small aircraft maintenance is being sought.

Unit code	Unit title	Prerequisites
MEA202	Remove and install basic aircraft electrical system components	MEA201
MEA204	Remove and install basic aircraft instrument system components	MEA201
MEA207	Remove and install aircraft electronic system components	MEA201
MEA210	Inspect, test and troubleshoot basic aircraft electrical systems and components	MEA202, MEA246

MEA212	Inspect, test and troubleshoot basic aircraft instrument systems and components	MEA204, MEA246
MEA216	Inspect, test and troubleshoot instrument landing systems and components	MEA206, MEA207 MEA246
MEA289	Maintain basic light aircraft avionic systems and components	MEA246
MEA290	Fit avionic modification sheet metal components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA291	Inspect, test and troubleshoot fixed wing single axis autopilot systems and components (Refer to Group F – MEA217 or MEA218 may be taken instead of this unit)	MEA207, MEA246

Group F

- Except for the B1.1 Licence, take between **two (2)** and **four (4)** of the listed units as required by the aircraft types being maintained and the unit selection guidelines in column 4 to bring the total unit count to **thirty (30)** units.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA202	Remove and install basic aircraft electrical system components	MEA201	Applicable to electrical retractable undercarriage
MEA206	Remove and install aircraft basic radio communication and navigation system components	MEA201	Includes HF radio
MEA210	Inspect, test and troubleshoot basic aircraft electrical systems and components	MEA202, MEA246	Applicable to electrical retractable undercarriage
MEA214	Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components	MEA206, MEA246	Includes HF radio

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA216	Inspect, test and troubleshoot instrument landing systems and components	MEA206, MEA207 MEA246	Required for ILS
MEA217	Inspect, test and troubleshoot fixed wing autopilot systems and components	MEA207, MEA246	Required for 3 axis autopilot system – may be taken instead of Group E unit MEA291A
MEA218	Inspect, test and troubleshoot rotary wing autopilot systems and components	MEA207, MEA246	Required for helicopter autopilot system
MEA220	Inspect, test and troubleshoot aircraft primary radar systems and components	MEA207, MEA246	Applicable to weather radar
MEA221	Inspect, test and troubleshoot aircraft secondary radar systems and components	MEA207, MEA246	Covers RADALT, DME, Doppler and ACAS
MEA277	Maintain twin engine aircraft electrical systems and components	MEA210	Mandatory for maintenance of light twin piston engine aircraft
MEA278	Inspect, test and troubleshoot instrument display systems and components	MEA207, MEA246	Applicable to electronic display systems
MEA279	Inspect, test and troubleshoot piston engine full authority digital engine control systems	MEA207, MEA246	Required for FADEC system maintenance
MEA281	Maintain light aircraft AC powered instrument systems and components	MEA246	
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Applicable to hydraulic retractable undercarriage and systems with engine driven pump

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA303	Remove and install aircraft pneumatic system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Applicable to aircraft types with air cycle air conditioning and pressurisation
MEA306	Remove and install engines and engine system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Applicable to piston and gas turbine engines
MEA307	Remove and install propeller systems and components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Covers variable pitch and constant speed propellers
MEA308	Remove and install rotary wing rotor and flight control system components	MEA302	Applicable if helicopter has powered flight controls
MEA309	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components	MEA302	Applicable to hydraulic retractable undercarriage and systems with engine driven pump
MEA310	Inspect, test and troubleshoot aircraft pneumatic systems and components	MEA303	Applicable to aircraft types with air cycle air conditioning and pressurisation
MEA313	Inspect, test and troubleshoot piston engine systems and components	MEA306 (deemed to be covered if MEA353 is held)	Covers turbo and supercharged engines
MEA314	Inspect, test and troubleshoot gas turbine engine systems and components	MEA306	For gas turbine engine maintenance
MEA315	Inspect, test and troubleshoot propeller systems and components	MEA307	Covers variable pitch and constant speed propellers
MEA316	Inspect, test and troubleshoot rotary wing rotor and control	MEA308	Applicable if helicopter has powered flight

Unit code	Unit title	Prerequisites	Unit selection guidelines
	systems and components		controls
MEA325	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications	All applicable Certificate IV units	Elective
MEA351	Maintain airframe systems of basic light fixed wing aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective if not required by choice of Group A to E
MEA352	Maintain basic rotary wing aircraft systems	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective if not required by choice of Group A to E
MEA353	Maintain basic light aircraft engines and propellers	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective if not required by choice of Group A to E
MEA354	Maintain light aircraft pneumatic systems	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
MEA355	Maintain light aircraft air cycle air conditioning systems	MEA201, MEA246	Elective
MEA356	Maintain light piston engine aircraft pressurisation systems	MEA201, MEA246	Elective
MEA357	Inspect, test and repair aircraft fabric surfaces	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Required for aircraft with fabric surfaces
MEA358	Re-cover aircraft fabric surfaces		Elective
MEA359	Inspect and repair aircraft wooden structures	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Required for aircraft with wooden structure
MEA360	Maintain aircraft diesel engines	MEA353	Required for aircraft types with two or four stroke diesel engines
MEA361	Maintain aircraft two stroke	MEA353	Required for aircraft

Unit code	Unit title	Prerequisites	Unit selection guidelines
	petrol engines		types with two stroke petrol engines
MEA362	Maintain aircraft vapour cycle air conditioning systems	MEA201, MEA246	Elective
MEA367	Repair/modify aircraft composite structure using cold bonding	MEA369	Required for repairs to composite primary or secondary structure using cold bonding only
MEA371	Perform major repairs and modifications to small aircraft metal structure	MEA369, MEA370	Elective
MEA372	Perform mechanical elementary maintenance	MEA301	Required for B2 licence holders to perform mechanical elementary maintenance
MEA405	Repair/modify aircraft composite material structure/components	MEA401 (deemed to be covered if MEA369 is held)	Required for repairs to composite primary or secondary structure using hot or cold bonding
MEA512	Maintain general aviation recovery devices with ballistic parachute systems	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 DEFEO101D	Elective
DEFEO101D	Work safely with explosive ordnance		Elective

Qualification Mapping Information

Release 2 - Qualification Description for MEA41015 revised to comply with CASA licensing requirements. No change to outcomes.

Release 1 - Supersedes and is equivalent to MEA41011 Certificate IV in Aeroskills (Mechatronics)

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA41115 Certificate IV in Aircraft Life Support and Furnishing

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to members of the Australian Defence Force (ADF) and to employees of Civil Aviation Maintenance Organisations (AMOs) who work at supervisor or team leader levels on the maintenance of aircraft and personal life support equipment and on the fabrication and maintenance of aircraft furnishings.

The qualification consists of:

- mandatory common units that apply to all Aeroskills qualifications at Certificate III and IV levels and elective common units that relate to the regulatory system within which individuals are employed
- elective technical stream units and imported units.

The qualification provides a number of credits towards other Aeroskills qualifications at Certificate III and IV levels and a limited number of credits towards a Diploma or Advanced Diploma of Aviation Maintenance Management.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and the Civil Aviation Safety Authority (CASA). Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA41115 Certificate IV in Aircraft Life Support and Furnishing, competency must be demonstrated in **twenty-six (26)** units of competency, as follows:

- **ten (10)** core common and imported units
- **one (1)** elective unit from the common units listed in Group A
- **fifteen (15)** elective units from the technical stream and imported units listed in Group B.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA115	Plan and implement aeronautical product maintenance activities	
MEA116	Apply work health and safety procedures at supervisor level	
MEA118	Conduct self in the aviation maintenance environment	
MSAENV472B	Implement and monitor environmentally sustainable work practices	

Elective units of competency

Group A

- Complete at least **one (1)** of the following two units chosen in accordance with the unit selection guidelines in column 4.

Unit code	Unit title	Prerequisite	Unit selection guidelines

Unit code	Unit title	Prerequisite	Unit selection guidelines
MEA114	Certify aeronautical product maintenance	All Cert IV units applicable to the tasks	Applicable to those working under CASA Airworthiness Regulations
MEA140	Supervise aviation maintenance teams and perform maintenance quality inspections	Appointment as an MQI or Independent Inspector	Applicable to those working under ADF Airworthiness Regulations

Group B

- Complete **fifteen (15)** of the technical stream and imported units listed below; selected in accordance with the prerequisites in column 3 and the unit selection criteria in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA240	Use electrical test equipment to perform basic electrical tests	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA303	Remove and install aircraft pneumatic system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA304	Remove and install non-pressurised aircraft structural and non-structural components	MEA302	Elective – do not take with MEA317
MEA317	Remove and install pressurised aircraft structural and non-structural components	MEA302, MEA303	Elective – do not take with MEA304

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA411	Remove surface coatings from aircraft or aircraft components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
MEA412	Pre-treat aluminium alloy surfaces	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
MEA414	Remove light corrosion from aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective – do not take with MEA419
MEA416	Apply aircraft identification markings, graphics and decals	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
MEA419	Repair/modify aircraft cabin/cockpit non-primary structure components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective – do not take with MEA414
MEA501	Maintain and fit anti-G suits	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MSFSF2002	Elective
MEA502	Maintain and fit helmets	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118, MEA240	Elective
MEA503	Maintain and fit immersion suits	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118 LMTTF2008A	Elective

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA504	Maintain and fit oxygen masks	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118, MEA240	Elective
MEA505	Maintain and pack parachutes	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118, MEA511 MSFSF2002	Elective
MEA507	Maintain, pack and fit survival inflatable buoyancy vests	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118	Elective
MEA508	Maintain, install and remove restraint systems	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118, MEA511 MSFSF2002	Elective
MEA509	Manufacture, repair and alter aircraft related fabric components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118, MEA511 MSFSF2002	Elective
MEA510	Maintain seat and pod electrical and electronic systems	MEA240	Elective
MEA511	Operate and maintain sewing machines and overlockers		Elective
MEA513	Maintain and pack survival inflatable life rafts	MEA101, MEA103 MEA105, MEA107	Elective

Unit code	Unit title	Prerequisites	Unit selection guidelines
		MEA108, MEA109 MEA118	
MEA514	Maintain and pack escape slides	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 MEA118	Elective
AURVTT2004	Trim vehicle components		Elective – do not take with MSFUP3012
AURVTT2005	Select and apply trim and fabric materials		Elective
AURVTT2006	Select and apply trim and fabric adhesives		Elective - do not take with LMTTF2008A
DEFEO101D	Work safely with explosive ordnance		Elective
DEFEO501D	Conduct explosive ordnance inspection		Elective
LMTTF2008A	Use adhesives		Elective – do not take with AURVTT2006
MEM12001B	Use comparison and basic measuring devices		Mandatory
MSFSF2001	Cut single layer fabrics		Elective
MSFSF2002	Machine sew materials		Elective
MSFUP3012	Apply marine sewing and installation techniques		Elective – do not take with AURVTT2004

Qualification Mapping Information

Supersedes and is equivalent to MEA41111 Certificate IV in Aircraft Life Support and Furnishing

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA41215 Certificate IV in Aeroskills (Armament)

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to members of the Australian Defence Force (ADF) who perform scheduled inspections, fault diagnosis and repair, and modification of aircraft egress, stores management and stores suspension systems and system components, and maintenance of guided weapons. It should be noted that employment in this field also involves the attainment of a range of competencies in the explosive ordnance field. The explosive ordnance units of competency are in the DEF12 Defence Training Package and in the TLI10 Transport and Logistics Training Package and are not included in this qualification other than five units dealing with safe handling of explosive ordnance that are required for the maintenance of egress systems and cartridge operated fire extinguishing systems in aircraft.

The qualification defines the exit from training and may apply to aircraft maintenance performed on flight lines and in hangars/workshops.

The qualification consists of:

- common units that apply to all Aeroskills specialist streams at Certificate III and IV levels
- avionic technical stream units relating to aircraft system and component maintenance
- one mechanical technical stream unit
- armament technical stream units
- imported units.

The qualification provides a number of credits towards other Aeroskills Certificate IV qualifications and towards the MEA50315 Diploma of Aviation Maintenance Management (Avionics) and the MEA60115 Advanced Diploma of Aviation Maintenance Management (Avionics).

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and the Civil Aviation Safety Authority (CASA). Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

ADF Armament trainees

Packaging Rules

To be awarded the MEA41215 Certificate IV in Aeroskills (Armament), competency must be demonstrated in **twenty (20)** units of competency, as follows:

- **thirteen (13)** core units consisting of common, imported and technical stream units
- **seven (7)** elective units consisting of imported and technical stream units selected from electives Group A.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA118	Conduct self in the aviation maintenance environment	
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA261	Use electronic test equipment	MEA101, MEA103 MEA105, MEA107

Unit code	Unit title	Prerequisites
		MEA108, MEA109
MSAENV272B	Participate in environmentally sustainable work practices	
DEFEO101D	Work safely with explosive ordnance	

Elective units of competency

Group A

- Complete **seven (7)** of the listed imported and technical stream units while observing the unit prerequisite requirements.

Unit code	Unit title	Prerequisites
MEA203	Remove and install advanced aircraft electrical system components	MEA201
MEA211	Inspect, test and troubleshoot advanced aircraft electrical systems and components	MEA203, MEA246
MEA301	Perform aircraft flight servicing	MEA101, MEA103 MEA104, MEA107 MEA108, MEA109
MEA601	Maintain aircraft egress systems	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 DEFEO101D
MEA602	Remove and install aircraft stores management system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 DEFEO101D
MEA603	Remove and install aircraft stores suspension systems and components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109 DEFEO101D
MEA604	Inspect, test and troubleshoot aircraft stores management systems and components	MEA602

Unit code	Unit title	Prerequisites
MEA605	Inspect, test and troubleshoot aircraft stores suspension systems and components	MEA603
AVIF3016A	Marshal aircraft	
DEFEO301D	Package ammunition	
DEFEO302D	Unpackage ammunition	
DEFEO501D	Conduct explosive ordnance inspection	
DEFEO718C	Maintain cartridge operated fire extinguishing systems	

Qualification Mapping Information

Supersedes and is equivalent to MEA41213 Certificate IV in Aeroskills (Armament)

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA41315 Certificate IV in Aeroskills (Structures)

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to employees of Civil Aviation Maintenance Organisations (AMOs) or to members of the Australian defence Force (ADF) who are engaged in the repair and modification of aircraft structures. The qualification defines the exit from apprenticeship and may apply to work performed in hangars on the structure of complete aircraft and to work performed in workshops on structural components.

The training pathways provide for work on both metal and composite structures. In some cases, primarily in the General Aviation sector, individuals may be also required to work on aircraft with wooden structures and/or fabric coverings. The applicable competencies are covered in the units MEA357 Inspect, test and repair aircraft fabric surfaces, MEA358 Re-cover aircraft fabric surfaces and MEA359 Inspect and repair aircraft wooden structures.

The qualification consists of:

- common and imported units that apply to all Aeroskills specialist streams at AQF Certificate III and IV levels
- mandatory structures technical stream units
- elective mechanical technical stream units that provide a degree of multi-skilling where needed to meet workplace requirements
- elective structures technical stream and imported units required to meet workplace needs.

The qualification also provides credits towards the MEA50415 Diploma of Aviation Maintenance Management (Mechanical) and the MEA60215 Advanced Diploma of Aviation Maintenance Management (Mechanical). A limited number of credits are also provided towards the MEA50215 Diploma of Aeroskills (Mechanical).

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and the Civil Aviation Safety Authority (CASA). Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA41315 Certificate IV in Aeroskills (Structures), competency must be demonstrated in **nineteen (19)** units of competency, as follows:

- **fourteen (14)** core units consisting of common, imported and technical stream units
- **five (5)** elective technical stream units from Group A.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA118	Conduct self in the aviation maintenance environment	
MEA327	Fabricate and/or repair aircraft mechanical components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA401	Inspect aircraft structures	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA420	Fabricate basic structural components for aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

Unit code	Unit title	Prerequisites
MEA421	Fabricate advanced structural components for aircraft	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA422	Repair/modify aircraft metal structure	MEA401
MEA423	Aircraft structure major disassembly and reassembly	MEA401
MSAENV272B	Participate in environmentally sustainable work practices	

Elective units of competency

Group A

- Select **five (5)** units while observing the unit selection guidelines in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
MEA303	Remove and install aircraft pneumatic system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
MEA304	Remove and install non-pressurised aircraft structural and non-structural components	MEA302	Elective
MEA305	Remove and install aircraft fixed wing flight control system components	MEA302	Elective
MEA308	Remove and install rotary wing rotor and flight control system	MEA302	Elective

Unit code	Unit title	Prerequisites	Unit selection guidelines
	components		
MEA317	Remove and install pressurised aircraft structural and non-structural components	MEA302 MEA303	Elective
MEA367	Repair/modify aircraft composite structure using cold bonding	MEA401	Take this unit or MEA405
MEA405	Repair/modify aircraft composite material structure/components	MEA401	Alternate to MEA367
MEA410	Maintain aircraft structure/components	MEA401	Elective
MEA411	Remove surface coatings from aircraft or aircraft components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Elective
MEA425	Perform bolted composite skin repairs	MEA401	Elective
AVIF3016A	Marshal aircraft		Elective
MEM06003C	Carry out heat treatment		Elective

Qualification Mapping Information

Supersedes and is equivalent to MEA41311 Certificate IV in Aeroskills (Structures)

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA50115 Diploma of Aeroskills (Avionics)

Modification History

Release 1 - New qualification

Qualification Description

The qualification applies to individuals seeking the grant of a Civil Aviation Safety Authority (CASA) B2 Aircraft Maintenance Engineer Licence covering the supervision, performance and certification of avionic maintenance on aircraft that are type-rated by CASA for maintenance purposes.

The qualification satisfies CASA requirements for the grant, under Civil Aviation Safety Regulation (CASR) Part 66, of Aircraft Maintenance Engineer Licence B2 when the skills and knowledge requirements align with CASA syllabus requirements in the Companion Volume CASA Interface and training has been delivered in accordance with the requirements of CASR Part 147. It consists of:

- common and technical stream units required at Certificate IV level in the aircraft maintenance stream
- additional Diploma level common and imported units that cover supervisor level work health and safety (WHS) competency plus competencies required by CASA for the exercise of licence privileges
- Diploma level avionic technical stream units covering advanced fault diagnosis and aircraft weight and balance calculation.

Credits are also provided towards the MEA50315 Diploma of Aviation Maintenance Management (Avionics) and the MEA60115 Advanced Diploma of Aviation Maintenance Management (Avionics).

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA50115 Diploma of Aeroskills (Avionics) competency must be demonstrated in **thirty-two (32)** or **thirty-three (33)** units of competency, depending on the choice of elective specialist units. These units consist of:

- **eight (8)** core Diploma level (CASA licensing) units
- **twenty-three (23)** core common and technical stream units from Certificate IV that are mandatory for a CASA B2 Licence

- either elective Group A (**two (2)** units) or Group B (**one (1)** unit).

Core units of competency

- Complete all **eight (8)** of the Diploma level common, imported and avionic technical stream units listed below.

Unit code	Unit title	Prerequisites
MEA111	Perform administrative processes to prepare for the certification of civil aircraft maintenance	All Cert IV units listed below (See Note 1)
MEA112	Plan and implement civil aircraft maintenance activities	All Cert IV units listed below (see Note 1)
MEA113	Supervise civil aircraft maintenance activities and manage human resources in the workplace	All Cert IV units listed below (see Note 1)
MEA116	Apply work health and safety procedures at supervisor level in aviation maintenance	
MEA142	Manage self in the aviation maintenance environment	
MEA235	Perform advanced troubleshooting in aircraft avionic maintenance	All Cert IV units listed below (see Note 1)
MEA241	Perform aircraft weight and balance calculations as a result of modifications	All Cert IV units listed below (see Note 1)
MSAENV472B	Implement and monitor environmentally sustainable work practices	

Note 1: While the units do not have specific prerequisite units it is a CASA licensing requirement that competency not be sought until all of the Certificate IV units listed below have been attained.

- Plus the **twenty-three (23)** Certificate IV common and avionic/mechanical technical stream units listed below.

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA118	Conduct self in the aviation maintenance environment	
MEA148	Apply mathematics and physics in aviation maintenance	
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA203	Remove and install advanced aircraft electrical system components	MEA201
MEA205	Remove and install advanced aircraft instrument system components	MEA201
MEA206	Remove and install aircraft basic radio communication and navigation system components	MEA201
MEA207	Remove and install aircraft electronic system components	MEA201
MEA223	Inspect aircraft electrical systems and components	MEA203, MEA246
MEA224	Inspect aircraft instrument systems and components	MEA205, MEA246
MEA226	Inspect aircraft electronic systems and components	MEA207, MEA246

Unit code	Unit title	Prerequisites
MEA227	Test and troubleshoot aircraft electrical systems and components	MEA223
MEA228	Test and troubleshoot aircraft instrument systems and components	MEA224, MEA226
MEA229	Test and troubleshoot aircraft radio frequency navigation and communications systems and components	MEA226
MEA232	Test and troubleshoot aircraft pulse systems and components	MEA226, MEA246
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA301	Perform aircraft flight servicing	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

Elective units of competency

Plus specialist elective units from Group A or Group B as defined below.

Group A

- Complete the **two (2)** units listed.

Unit code	Unit title	Prerequisites
MEA225	Inspect fixed wing aircraft automatic flight control systems and components	MEA207, MEA246
MEA230	Test and troubleshoot fixed wing aircraft automatic flight control systems and components	MEA225, MEA246

Group B

- Complete the **one (1)** unit listed.

Unit code	Unit title	Prerequisites
MEA231	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components	MEA207, MEA246

Qualification Mapping Information

Supersedes and is equivalent to MEA50111 Diploma of Aeroskills (Avionics)

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA50215 Diploma of Aeroskills (Mechanical)

Modification History

Release 2 - Total number of core Certificate IV units required for B1 Licence sub-categories corrected from 18 to 17.

Release 1 - New qualification

Qualification Description

The qualification applies to individuals seeking the grant of a Civil Aviation Safety Authority (CASA) B1 Aircraft Maintenance Engineer Licence covering the supervision, performance and certification of airframe, engine, electrical and structural maintenance on aircraft that are type-rated by CASA for maintenance purposes.

The requirement for the awarding of MEA50215 Diploma of Aeroskills (Mechanical) is demonstrated competency in listed units of competency under the conditions set out below. The listed units also satisfy CASA requirements for the grant, under Civil Aviation Regulation (CASR) Part 66, of Aircraft Maintenance Engineer B1 Licences in sub-categories B1.1 and B1.3 when the skills and knowledge requirements align with CASA syllabus requirements in the Companion Volume and CASA Interface and training has been delivered in accordance with the requirements of CASR Part 147.

The qualification consists of:

- common and technical stream units required at Certificate IV level in the aircraft maintenance stream with electives determined by the desired licence sub-category
- additional Diploma level common units that cover supervisor level work health and safety (WHS) competency plus competencies required by CASA for the exercise of licence privileges
- Diploma level mechanical technical stream units covering advanced fault diagnosis and aircraft weighing and weight and balance calculation.

The qualification also provides credits towards the MEA50415 Diploma of Aviation Maintenance Management (Mechanical) and the MEA60215 Advanced Diploma of Aviation Maintenance Management (Mechanical).

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA50215 Diploma of Aeroskills (Mechanical) competency must be demonstrated in **thirty-six (36) to forty-three (43)** units, chosen as described below.

All B1 Licence sub-categories require the following twenty-eight (28) units:

- **eleven (11)** core Diploma level (CASA licensing) common, technical stream and imported units
- **seventeen (17)** core Certificate IV common and technical stream units.

Depending on the CASA B1 Licence sub-category being sought, an additional **eight (8) to fifteen (15)** units are required, up to a maximum of **forty-three (43)** units for the qualification. All units must be chosen as specified under the conditions set out below:

- Group A elective technical stream units required by CASA for a B1.1 Licence – **thirteen (13) or fifteen (15)** units
- Group B elective technical stream units required by CASA for a B1.3 Licence – **eight (8)** units.

Core units of competency

- Complete the **eleven (11)** Diploma level common and mechanical technical stream units listed below.

Unit code	Unit title	Prerequisites
MEA111	Perform administrative processes to prepare for the certification of civil aircraft maintenance	All Cert IV units listed below for applicable licence (see Note 1)
MEA112	Plan and implement civil aircraft maintenance activities	All Cert IV units listed below for applicable licence (see Note 1)
MEA113	Supervise civil aircraft maintenance activities and manage human resources in the workplace	All Cert IV units listed below for applicable licence (see Note 1)
MEA116	Apply work health and safety procedures at supervisor level in aviation maintenance	

Unit code	Unit title	Prerequisites
MEA142	Manage self in the aviation maintenance environment	
MEA148	Apply mathematics and physics in aviation maintenance	
MEA323	Perform advanced troubleshooting in aircraft mechanical maintenance	All Cert IV units listed below for applicable licence (see Note 1)
MEA325	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications	All Cert IV units listed below for applicable licence (see Note 1)
MEA343	Remove and install avionic system components	MEA211 or MEA227
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications	All Cert IV units listed below for applicable licence (see Note 1)
MSAENV472B	Implement and monitor environmentally sustainable work practices	

Note 1: While the units do not have specific prerequisite units it is a CASA licensing requirement that competency not be sought until all of the Certificate IV units listed below for the applicable licence have been attained.

- Plus the following **seventeen (17)** core Certificate IV common and avionic/mechanical technical stream units listed below which are mandatory for both B1.1 and B1.3 Licence sub-categories.

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108

Unit code	Unit title	Prerequisites
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA118	Conduct self in the aviation maintenance environment	
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA203	Remove and install advanced aircraft electrical system components	MEA201
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA301	Perform aircraft flight servicing	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA303	Remove and install aircraft pneumatic system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA306	Remove and install engines and engine system components	MEA302
MEA328	Maintain and/or repair aircraft mechanical components or parts	MEA302, MEA303

Unit code	Unit title	Prerequisites
MEA339	Inspect, repair and maintain aircraft structures	MEA304 or MEA317

Elective units of competency

Group A

- To meet the criteria for the grant of a B1.1 Licence complete **thirteen (13)** or **fifteen (15)** units listed below as specified in the unit selection guidelines in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA208	Remove and install pressurisation control system components	MEA201	
MEA209	Remove and install aircraft oxygen system components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	
MEA219	Inspect, test and troubleshoot pressurisation control systems and components	MEA208 MEA246	
MEA222	Inspect, test and troubleshoot aircraft oxygen systems and components	MEA209	
MEA223	Inspect aircraft electrical systems and components	MEA203, MEA246	
MEA227	Test and troubleshoot aircraft electrical systems and components	MEA223	
MEA305	Remove and install aircraft fixed wing flight control system components	MEA302	
MEA307	Remove and install propeller systems and components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109	Mandatory for B1.1 where the rating sought

Unit code	Unit title	Prerequisites	Unit selection guidance
			includes propellers
MEA315	Inspect, test and troubleshoot propeller systems and components	MEA307	Mandatory unit for B1.1 where the rating sought includes propellers
MEA317	Remove and install pressurised aircraft structural and non-structural components	MEA302, MEA303	
MEA318	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components	MEA302, MEA303 MEA305	
MEA319	Inspect gas turbine engine systems and components	MEA306	
MEA320	Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components	MEA318	
MEA321	Test and troubleshoot aircraft fixed wing flight control systems and components	MEA318	
MEA322	Test and troubleshoot gas turbine engine systems and components	MEA319	

Group B

- To meet the criteria for the grant of a B1.3 Licence complete **eight (8)** units listed below.

Unit code	Unit title	Prerequisites
MEA211	Inspect, test and troubleshoot advanced aircraft electrical systems and components	MEA203, MEA246
MEA304	Remove and install non-pressurised aircraft structural and	MEA302

Unit code	Unit title	Prerequisites
	non-structural components	
MEA308	Remove and install rotary wing rotor and flight control system components	MEA302
MEA309	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components	MEA302
MEA310	Inspect, test and troubleshoot aircraft pneumatic systems and components	MEA303
MEA316	Inspect, test and troubleshoot rotary wing rotor and control systems and components	MEA308
MEA319	Inspect gas turbine engine systems and components	MEA306
MEA322	Test and troubleshoot gas turbine engine systems and components	MEA319

Qualification Mapping Information

This qualification supersedes and is equivalent to MEA50211 with regard to eligibility for the grant of B1.1 and B1.3 Licences.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA50315 Diploma of Aviation Maintenance Management (Avionics)

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to individuals employed in aviation maintenance management fields in both the Civil Aviation Safety Authority (CASA) and Australian Defence Force (ADF) regulatory environments in jobs such as avionic maintenance team leaders, maintenance planners, spares assessors, repairable item managers and technical authors. It must be emphasised that many of the maintenance management positions applicable to the qualification have additional experience requirements specified in airworthiness regulations and only a limited range of employment opportunities may be available to those who do not have extensive prior aviation maintenance experience. For this reason the qualification has entry requirements.

The qualification consists of:

- eleven (11) core units that provide competencies applicable to aviation maintenance managers
- one (1) or (2) elective units chosen according to employment need.

Credit is provided towards the MEA60115 Advanced Diploma of Aviation Maintenance Management (Avionics).

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Individuals seeking this qualification must meet at least one of the following entry criteria:

- at least five years current aviation avionic maintenance experience
- Maintenance Engineer Licence (Avionics) issued by CASA
- Certificate IV in Aeroskills (Avionics).

Packaging Rules

To be awarded the MEA50315 Diploma of Aviation Maintenance Management (Avionics), competency must be demonstrated in a total of **twelve (12)** or **thirteen (13)** units of competency.

All units must be chosen as specified under the conditions set out below:

- **eleven (11)** core Diploma level common, engineering and imported units
- **one (1)** or **two (2)** elective Diploma level common units from Group A.

Core units of competency

- Complete the following **five (5)** common Diploma units, **five (5)** paraprofessional engineering units and **one (1)** imported sustainability unit listed below.

Unit code	Unit title	Prerequisites
MEA116	Apply work health and safety procedures at supervisor level in aviation maintenance	
MEA121	Manage aircraft/aeronautical product configuration	
MEA133	Communicate aviation technical and maintenance knowledge	
MEA135	Use computers in aviation maintenance-related integrated logistic support activities	
MEA142	Manage self in the aviation maintenance environment	
MEA706	Apply basic scientific principles and techniques in avionic engineering situations	MEM23004A
MEA708	Select and test avionic engineering materials	
MEM23004A	Apply technical mathematics	
MEM30007A	Select common engineering materials	
MEM30012A	Apply mathematical techniques in a manufacturing, engineering or related environment	
MSAENV472B	Implement and monitor environmentally sustainable work practices	

Elective units of competency

Group A

- Plus **one (1)** of the following elective common units selected in accordance with the guidance provided in column 4. If MEA147 is required **two (2)** units must be taken.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA136	Assess aviation maintenance spares and manage repairable items	MEA135A	Elective – for spares assessors and repairable item managers
MEA137	Write aviation technical publications	MEA135A	Elective – for aviation technical authors
MEA140	Supervise aviation maintenance teams and perform maintenance quality inspections		Elective – for supervisors within the ADF regulatory system
MEA147	Perform airworthiness management and maintenance program tasks	MEA137A	Elective - applicable to CAMO employment

Qualification Mapping Information

Supersedes and is equivalent to MEA50311 Diploma of Aviation Maintenance Management (Avionics)

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA50415 Diploma of Aviation Maintenance Management (Mechanical)

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to individuals employed in aviation maintenance management fields in both the Civil Aviation Safety Authority (CASA) and Australian Defence Force (ADF) regulatory environments in jobs such as mechanical maintenance team leaders, maintenance planners, spares assessors, repairable item managers and technical authors. It must be emphasised that many of the maintenance management positions applicable to the qualification have additional experience requirements specified in airworthiness regulations and only a limited range of employment opportunities may be available to those who do not have extensive prior aviation maintenance experience. For this reason the qualification has entry requirements.

The qualification consists of:

- eleven (11) core units that provide competencies applicable to aviation maintenance managers
- one (1) or two (2) elective units chosen according to employment need.

Credit is provided towards the MEA60215 Advanced Diploma of Aviation Maintenance Management (Mechanical).

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Individuals seeking this qualification must meet at least one of the following entry criteria:

- at least five years current aviation mechanical maintenance experience
- Maintenance Engineer Licence (Mechanical) issued by CASA
- Certificate IV in Aeroskills (Mechanical).

Packaging Rules

To be awarded the MEA50411 Diploma of Aviation Maintenance Management (Mechanical), competency must be demonstrated in a total of **twelve (12)** or **thirteen (13)** units of competency.

All units must be chosen as specified under the conditions set out below:

- **eleven (11)** core Diploma level common, engineering and imported units
- **one (1) or (2)** elective Diploma level common units from Group A.

Core units of competency

- Complete the following **five (5)** common Diploma units, **five (5)** paraprofessional engineering units and **one (1)** imported sustainability unit listed below.

Unit code	Unit title	Prerequisites
MEA116	Apply work health and safety procedures at supervisor level in aviation maintenance	
MEA121	Manage aircraft/aeronautical product configuration	
MEA133	Communicate aviation technical and maintenance knowledge	
MEA135	Use computers in aviation maintenance-related integrated logistic support activities	
MEA142	Manage self in the aviation maintenance environment	
MEA705	Apply basic scientific principles and techniques in aeronautical engineering situations	MEM23004A
MEA707	Select and test aeronautical engineering materials	
MEM23004A	Apply technical mathematics	
MEM30007A	Select common engineering materials	
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	
MSAENV472B	Implement and monitor environmentally sustainable work practices	

Elective units of competency

Group A

- Plus **one (1)** of the following elective common units selected in accordance with the guidance in column four. If MEA147 is required **two (2)** units must be taken.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA136	Assess aviation maintenance spares and manage repairable items	MEA135	Elective – for spares assessors and repairable item managers
MEA137	Write aviation technical publications	MEA135	Elective – for aviation technical authors
MEA140	Supervise aviation maintenance teams and perform maintenance quality inspections		Elective – for supervisors within the ADF regulatory system
MEA147	Perform airworthiness management and maintenance program tasks	MEA137	Applicable to CAMO employment

Qualification Mapping Information

Supersedes and is equivalent to MEA50411 Diploma of Aviation Maintenance Management (Mechanical)

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA50515 Diploma of Aeroskills (Non-Destructive Testing)

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to individuals who perform non-destructive testing (NDT) on aircraft and aircraft components in accordance with *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* at Level 2 and in compliance with the regulatory requirements of the Civil Aviation Safety Authority (CASA) and of the Australian Defence Force (ADF).

The requirement for the awarding of MEA50515 Diploma of Aeroskills (Non-Destructive Testing) is demonstrated competency in listed units of competency under the conditions set out below. It consists of core units plus applicable units from electives Group A.

Core units are as follows:

- preliminary common and technical stream units for individuals who do not have a Certificate IV in Aeroskills
- mandatory units consisting of:
 - common and technical stream units that relate to the aviation maintenance environment
 - technical stream and imported units relating to the NDT work environment

imported units that specifically cover the competencies required to perform each relevant NDT technique to the standard specified in *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* for Level 2 personnel.

Elective Group A units consist of:

- common units specific to either CASA or ADF regulatory requirements
- technical stream and imported units that are applicable to various areas of employment in the NDT field.

The core and elective units provide for two training pathways to the qualification as follows:

- one that provides for Certificate IV qualified aviation tradespersons to progress to the Diploma level NDT qualification (the career path for uniformed ADF personnel and possibly some civilian personnel)

- another that provides for progression to Diploma level NDT qualification from direct entry (the career path that may be followed by NDT personnel used by the maintenance organisations other than those operating under the ADF regulatory system).

The qualification also provides credits towards the MEA50415 Diploma of Aviation Maintenance Management (Mechanical), the MEA60215 Advanced Diploma of Aviation Maintenance Management (Mechanical) and the MEA60315 Advanced Diploma of Aviation Non-Destructive Testing.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA50515 Diploma of Aeroskills (Non-Destructive Testing) competency must be demonstrated in **twenty-five (25)** to **thirty-four (34)** units, chosen as described below.

Core units of competency

- Individuals who do not have a Certificate IV in Aeroskills must complete the following **nine (9)** core preliminary units.

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA340	Lay out and set up aircraft systems	MEA101B,

		MEA107B MEA109B
MEA341	Apply basic aircraft design characteristics	MEA101B, MEA107B MEA109B
MEA342	Apply basic aircraft power plant design characteristics	MEA101B, MEA107B MEA109B

Individuals who have a Certificate IV in Aeroskills and those who have completed the preliminary units must complete the following **twenty-two (22)** core units.

Unit code	Unit title	Prerequisites
MEA116	Apply work health and safety procedures at supervisor level in aviation maintenance	
MEA133	Communicate aviation technical and maintenance management knowledge	
MEA135	Use computers in aviation maintenance-related integrated logistic support activities	
MEA142	Manage self in the aviation maintenance environment	
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA261	Use electronic test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA424	Evaluate aircraft structure non-destructive tests	MEA109, MEA133 MEM13013B MEM16010A MEM24002B MEM24004B MEM24006B MEM24008B MEM24010B MEM24012C

MEM09002B	Interpret technical drawing	
MEM09003B	Prepare basic engineering drawing	MEM09002B
MEM12003B	Perform precision mechanical measurement	MEM12023A (see Note 1)
MEM13013B	Work safely with ionising radiation	
MEM15017B	Use and maintain reference standards	MEM11011B MEM12003B MEM12004B (see Note 2) MEM12005B MEM12023A (see Note 1) MEM18001C (see Note 1) MEM18002B (see Note 1)
MEM16010A	Write reports	MEM14005A (see Note 3)
MEM24002B	Perform penetrant testing	MEM18001C (see Note 1) MEM24012C
MEM24004B	Perform magnetic particle testing	MEM18001C (see Note 1) MEM24012C
MEM24006B	Perform eddy current testing	MEM18001C (see Note 1)
MEM24008B	Perform ultrasonic testing	MEM18001C (see Note 1) MEM24012C
MEM24010B	Perform radiographic testing	MEM13013B

		MEM18001C (see Note 1) MEM24012C
MEM24012C	Apply metallurgy principles	
MEM30007A	Select common engineering materials	
MEM30012A	Apply mathematical techniques in a manufacturing, engineering or related environment	
MSAENV472B	Implement and monitor environmentally sustainable work practices	

Notes

1. MEA109 is equivalent to the following three units combined MEM12023A, MEM18001C and MEM18002B
2. MEA260 and MEA261 are together equivalent to MEM12004B
3. MEA103 is equivalent to MEM14005A

Elective units of competency

Group A

- Complete **three (3)** units chosen in accordance with the unit selection guidelines in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA112	Plan and implement civil aircraft maintenance activities	All relevant technical units	Mandatory for CASA regulatory system
MEA113	Supervise civil aircraft maintenance activities and manage human resources in the workplace	All relevant technical units	Mandatory for CASA regulatory system
MEA140	Supervise aviation maintenance teams and perform maintenance		Mandatory for ADF regulatory system

	quality inspections		
MEM15010B	Perform laboratory procedures		
MEM17002B	Conduct workplace assessment		
TAEDEL301A	Provide work skill instruction		

Qualification Mapping Information

Supersedes and is equivalent to MEA50511 Diploma of Aeroskills (Non-Destructive Testing)

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA50615 Diploma of Aeronautical Engineering

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to individuals employed in engineering departments of manufacturers and aviation maintenance organisations in both the Civil Aviation Safety Authority (CASA) and Australian Defence Force (ADF) regulatory environments. Individuals could also be employed in Continuing Airworthiness Management Organisations (CAMOs) and in ADF Approved Engineering Organisations (AEOs). Typical jobs could be supporting professional engineers in design teams, members of airworthiness review teams, maintenance planners, spares assessors, repairable item managers and technical authors. While a direct entry training pathway is provided it must be emphasised that many of the maintenance management positions applicable to the qualification have additional experience requirements specified in airworthiness regulations and only a limited range of employment opportunities may be available to those who do not have extensive prior aviation maintenance experience.

The qualification consists of twenty-six (26) units, of which seventeen (17) are core units and the remaining nine (9) are electives of which either three (3) or six (6) units must be chosen in accordance with unit selection guidance provided in the Group A table.

Credit is provided towards the MEA60415 Advanced Diploma of Aeronautical Engineering.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA50615 Diploma of Aeronautical Engineering, competency must be demonstrated in a total of **twenty (20)** or **twenty-three (23)** units of competency, consisting of:

- **seventeen (17)** core units
- **three (3)** electives chosen from Group A, for which unit selection guidelines have been provided. If Certificate IV in Aeroskills (Mechanical) is not held a further **three (3)** units must be taken from Group A, as specified in the unit selection guidelines.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA133	Communicate aviation technical and maintenance knowledge	
MEA135	Use computers in aviation maintenance-related integrated logistic support activities	
MEA142	Manage self in the aviation maintenance environment	
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA327	Fabricate and/or repair aircraft mechanical components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA705	Apply basic scientific principles and techniques in aeronautical engineering situations	MEM23004A
MEA707	Select and test aeronautical engineering materials	
MEM23004A	Apply technical mathematics	

Unit code	Unit title	Prerequisites
MEM30007A	Select common engineering materials	
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	
MSAENV472	Implement and monitor environmentally sustainable work practices	

Elective units of competency

Group A

- Take **three (3)** of the following elective units selected in accordance with the guidance in column 4. A further **three (3)** units is required if Certificate IV in Aeroskills (Mechanical) is not held.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA121	Manage aircraft/aeronautical product configuration		For employment within CAMOs and AEOs
MEA137	Write aviation maintenance technical publications	MEA135	For employment within CAMOs and AEOs
MEA147	Perform airworthiness management and maintenance program tasks	MEA137	For employment within CAMOs and AEOs
MEA340	Lay out and set up aircraft systems	MEA101, MEA107 MEA109	Must be taken if Certificate IV in Aeroskills (Mechanical) is not held
MEA341	Apply basic aircraft design characteristics	MEA101, MEA107 MEA109	Must be taken if Certificate IV in Aeroskills (Mechanical) is not held

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA342	Apply basic aircraft power plant design characteristics	MEA101, MEA107 MEA109	Must be taken if Certificate IV in Aeroskills (Mechanical) is not held
MEA701	Produce aeronautical engineering related graphics	MEA137 MEM30007A MEM30012A	For employment within engineering departments
MEA713	Integrate aeronautical fundamentals into an engineering task	MEA705 MEM23004A MEM23007A	For employment within engineering departments
MEM23007A	Apply calculus to engineering tasks	MEM23004A	For employment within engineering departments

Qualification Mapping Information

No equivalent qualification

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA50715 Diploma of Avionic Engineering

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to individuals employed in engineering departments of manufacturers and aviation maintenance organisations in both the Civil Aviation Safety Authority (CASA) and Australian Defence Force (ADF) regulatory environments. Individuals could also be employed in Continuing Airworthiness Management Organisations (CAMOs) and in ADF Approved Engineering Organisations (AEOs). Typical jobs could be supporting professional engineers in design teams, members of airworthiness review teams, maintenance planners, spares assessors, repairable item managers and technical authors. While a direct entry training pathway is provided it must be emphasised that many of the maintenance management positions applicable to the qualification have additional experience requirements specified in airworthiness regulations and only a limited range of employment opportunities may be available to those who do not have extensive prior aviation maintenance experience.

The qualification consists of twenty-nine (29) units, of which twenty (20) are core units and the remaining nine (9) units are electives from which either three (3) or five (5) units must be selected using the unit selection guidance in the Group A table.

Credit is provided towards the MEA60515 Advanced Diploma of Avionic Engineering.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA50715 Diploma of Avionic Engineering, competency must be demonstrated in a total of **twenty-three (23)** or **twenty-five (25)** units of competency, consisting of:

- **twenty (20)** core units
- **three (3)** elective units chosen from Group A plus a further **two (2)** units if Certificate IV in Aeroskills (Avionics) is not held.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA133	Communicate aviation technical and maintenance knowledge	
MEA135	Use computers in aviation maintenance-related integrated logistic support activities	
MEA142	Manage self in the aviation maintenance environment	
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA261	Use electronic test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

Unit code	Unit title	Prerequisites
MEA262	Modify/repair single layer printed circuit boards	MEA260, MEA261
MEA706	Apply basic scientific principles and techniques in avionic engineering situations	MEM23004A
MEA708	Select and test avionic engineering materials	
MEM23004A	Apply technical mathematics	
MEM30007A	Select common engineering materials	
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	
MSAENV472B	Implement and monitor environmentally sustainable work practices	

Elective units of competency

Group A

- Take **three (3)** of the following elective units selected in accordance with the guidance in column 4. If certificate IV in Aeroskills (Avionics) is not held take an additional **two (2)** units in accordance with the unit selection guidelines.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA121A	Manage aircraft/aeronautical product configuration		For employment within CAMOs and AEOs
MEA137A	Write aviation maintenance technical publications	MEA135	For employment within CAMOs and AEOs
MEA147A	Perform airworthiness management and maintenance program tasks	MEA137	For employment within CAMOs and AEOs
MEA270	Lay out avionic systems	MEA101, MEA107 MEA109	Must be taken if Certificate IV in Aeroskills

Unit code	Unit title	Prerequisites	Unit selection guidance
			(Avionics) is not held
MEA271	Lay out avionic flight management systems	MEA101, MEA107 MEA109, MEA270	Must be taken if Certificate IV in Aeroskills (Avionics) is not held
MEA702A	Produce avionics engineering related graphics	MEA137, MEM30007A MEM30012A	For employment within engineering departments
MEA714A	Integrate avionic fundamentals into an engineering task	MEA706 MEM23004A MEM23007A OR MEA727	For employment within engineering departments
MEA727	Apply calculus to engineering situations	MEM23004A	
MEM23007A	Apply calculus to engineering tasks	MEM23004A	For employment within engineering departments

Qualification Mapping Information

No equivalent qualification

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA60115 Advanced Diploma of Aviation Maintenance Management (Avionics)

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to individuals employed in managerial positions in both the Civil Aviation Safety Authority (CASA) and Australian Defence Force (ADF) regulatory environments in the fields of avionic maintenance management and integrated logistic support (ILS). It should also be noted that most of the maintenance management positions applicable to this qualification have airworthiness regulatory requirements regarding aviation maintenance experience. There is therefore no direct entry pathway to the qualification.

The qualification consists of:

- twenty-five (25) common units and two (2) imported units, seventeen (17) of which are elective, that provide general competencies applicable to aviation maintenance managers
- five (5) paraprofessional avionic engineering units.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Individuals seeking this qualification must meet at least one of the following entry criteria:

- at least five years current avionic maintenance experience
- Maintenance Engineer Licence (Avionics) issued by CASA
- Certificate IV in Aeroskills (Avionics)
- Diploma of Aviation Maintenance Management (Avionics).

Packaging Rules

To be awarded the MEA60115 Advanced Diploma of Aviation Maintenance Management (Avionics), competency must be demonstrated in a total of **twenty (20)** units of competency, as described below.

If a Diploma of Aviation Maintenance Management (Avionics) has been attained, **ten (10)** of the required units will be already held and the number of additional units required is **ten (10)**.

In all other cases the number of units required is **twenty (20)**.

All units must be chosen as specified under the conditions set out below:

- **sixteen (16)** core units consisting of engineering, common and imported units
- **four (4)** elective units chosen from the common and imported units in Group A.

Core units of competency

- The **five (5)** paraprofessional engineering units listed below are mandatory for those who do not have a Diploma of Aviation Maintenance Management (Avionics).

Unit code	Unit title	Prerequisites
MEA706	Apply basic scientific principles and techniques in avionic engineering situations	MEM23004A
MEA708	Select and test avionic engineering materials	
MEM23004A	Apply technical mathematics	
MEM30007A	Select common engineering materials	
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	

- Complete the **eleven (11)** Advanced Diploma/Diploma common and imported units listed below (those with a Diploma of Aviation Maintenance Management (Avionics) will already have MEA121, MEA133, MEA135 and MEA142).

Unit code	Unit title	Prerequisites
MEA120	Manage an aviation maintenance quality system	
MEA121	Manage aircraft/aeronautical product configuration	
MEA123	Manage aviation maintenance work environment policy and practices	
MEA124	Coordinate change programs in the aviation maintenance environment	
MEA125	Develop aviation maintenance personnel	

Unit code	Unit title	Prerequisites
MEA133	Communicate aviation technical and maintenance knowledge	
MEA134	Establish, maintain and evaluate the organisation's work health and safety system	
MEA135	Use computers in aviation maintenance-related integrated logistic support activities	
MEA141	Manage risk in aviation maintenance	
MEA142	Manage self in the aviation maintenance environment	
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	

Elective units of competency

Group A

- Plus **four (4)** of the elective Advanced Diploma/Diploma common and imported units listed below (those with a Diploma of Aviation Maintenance Management (Avionics) will already have one (1) of MEA136, MEA137 and MEA140). Units should be selected using the guidance in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA115	Plan and implement aeronautical product maintenance activities		
MEA122	Manage aircraft/equipment system performance testing	MEA126	
MEA126	Manage aircraft maintenance activities		
MEA127	Provide technical advice in the maintenance and management of aircraft and aeronautical product	MEA706, MEA708	Applicable to the CASA regulatory environment

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA128	Provide engineering advice in the modification, maintenance and management of aircraft systems	MEA706, MEA708	Applicable to the ADF regulatory environment
MEA129	Investigate technical aspects of aviation occurrences		Applicable to the ADF regulatory environment
MEA130	Manage deployed/detached aviation maintenance activities		Applicable to the ADF regulatory environment
MEA131	Manage the custody, transfer and disposal of aircraft, aeronautical product and support equipment		
MEA132	Manage budgetary resources in the aviation maintenance environment		Either MEA146 or PSPMNGT610A may be taken instead of this unit
MEA136	Assess aviation maintenance spares and manage repairable items	MEA135	
MEA137	Write aviation technical publications	MEA135	
MEA138	Perform aviation technical publication management activities	MEA137	
MEA139	Perform aviation maintenance-related integrated logistic support activities		
MEA140	Supervise aviation maintenance teams and perform maintenance quality inspections		For supervisors within the ADF regulatory system
MEA143	Develop and manage maintenance error management		Applicable to the CASA regulatory

Unit code	Unit title	Prerequisites	Unit selection guidance
	programs		environment
MEA146	Prepare and manage aviation maintenance organisation budgets and financial plans		Alternative to MEA132 and to PSPMNGT610A
MEA147	Perform airworthiness management and maintenance program tasks	MEA137	Applicable to CAMO employment
PSPMNGT610A	Manage public sector financial resources		Alternative to MEA132 and to MEA146

Qualification Mapping Information

Supersedes and is equivalent to MEA60111 Advanced Diploma of Aviation Maintenance Management (Avionics)

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA60215 Advanced Diploma of Aviation Maintenance Management (Mechanical)

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to individuals employed in managerial positions in both the Civil Aviation Safety Authority (CASA) and Australian Defence Force (ADF) regulatory environments in the fields of mechanical maintenance management and integrated logistic support (ILS). It should also be noted that most of the maintenance management positions applicable to this qualification also have airworthiness regulatory requirements regarding aviation maintenance experience. There is therefore no direct entry pathway to the qualification.

The qualification consists of:

- twenty-five (25) common units and two (2) imported units, seventeen (17) of which are elective, that provide general competencies applicable to aviation maintenance managers
- five (5) paraprofessional aeronautical engineering units.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Individuals seeking this qualification must meet at least one of the following entry criteria:

- at least five years current aviation mechanical maintenance experience
- Maintenance Engineer Licence (Mechanical) issued by CASA
- Certificate IV in Aeroskills (Mechanical)
- Diploma of Aviation Maintenance Management (Mechanical).

Packaging Rules

To be awarded the MEA60215 Advanced Diploma of Aviation Maintenance Management (Mechanical), competency must be demonstrated in a total of **twenty (20)** units of competency, as described below.

If the Diploma of Aviation Maintenance Management (Mechanical) has been achieved, the number of units required is **ten (10)**.

In all other cases, the number of units required is **twenty (20)**.

All units must be chosen as specified under the conditions set out below:

- **sixteen (16)** core units consisting of engineering, common and imported units
- **four (4)** elective units chosen from the common and imported units in Group A.

Core units of competency

- The **five (5)** paraprofessional engineering units listed below are mandatory for those who do not have a Diploma of Aviation Maintenance Management (Mechanical).

Unit code	Unit title	Prerequisites
MEA705	Apply basic scientific principles and techniques in aeronautical engineering situations	MEM23004A
MEA707	Select and test aeronautical engineering materials	
MEM23004A	Apply technical mathematics	
MEM30007A	Select common engineering materials	
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	

- Complete the **eleven (11)** Advanced Diploma/Diploma common units listed below (those with Diploma of Aviation Maintenance Management (Mechanical) will already have MEA121, MEA133, MEA135 and MEA142).

Unit code	Unit title	Prerequisites
MEA120	Manage an aviation maintenance quality system	
MEA121	Manage aircraft/aeronautical product configuration	
MEA123	Manage aviation maintenance work environment policy and practices	
MEA124	Coordinate change programs in the aviation	

Unit code	Unit title	Prerequisites
	maintenance environment	
MEA125	Develop aviation maintenance personnel	
MEA133	Communicate aviation technical and maintenance knowledge	
MEA134	Establish, maintain and evaluate the organisation's work health and safety system	
MEA135	Use computers in aviation maintenance-related integrated logistic support activities	
MEA141	Manage risk in aviation maintenance	
MEA142	Manage self in the aviation maintenance environment	
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	

Elective units of competency

Group A

- Take **four (4)** of the elective Advanced Diploma/Diploma common units listed below (those with Diploma of Aviation Maintenance Management (Mechanical) will already have **one (1)** of MEA136, MEA137 and MEA140). Units should be selected using the guidance in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA115	Plan and implement aeronautical product maintenance activities		
MEA122	Manage aircraft/equipment system performance testing	MEA126	
MEA126	Manage aircraft maintenance activities		
MEA127	Provide technical advice in the maintenance and management of	MEA705, MEA707	Applicable to the CASA regulatory

Unit code	Unit title	Prerequisites	Unit selection guidance
	aircraft and aeronautical product		environment
MEA128	Provide engineering advice in the modification, maintenance and management of aircraft systems	MEA705, MEA707	Applicable to the ADF regulatory environment
MEA129	Investigate technical aspects of aviation occurrences		Applicable to the ADF regulatory environment
MEA130	Manage deployed/detached aviation maintenance activities		Applicable to the ADF regulatory environment
MEA131	Manage the custody, transfer and disposal of aircraft, aeronautical product and support equipment		
MEA132	Manage budgetary resources in the aviation maintenance environment		Either MEA146 or PSPMNGT610A may be taken instead of this unit
MEA136	Assess aviation maintenance spares and manage repairable items	MEA135	
MEA137	Write aviation maintenance technical publications	MEA135	
MEA138	Perform aviation technical publication management activities	MEA137	
MEA139	Perform aviation maintenance-related integrated logistic support management activities		
MEA140	Supervise aviation maintenance teams and perform maintenance quality inspections		For supervisors within the ADF regulatory system
MEA143	Develop and manage maintenance error management		Applicable to the CASA regulatory

Unit code	Unit title	Prerequisites	Unit selection guidance
	programs		environment
MEA146	Prepare and manage aviation maintenance organisation budgets and financial plans		Alternative to MEA132 and to PSPMNGT610A
MEA147	Perform airworthiness management and maintenance program tasks	MEA137	Applicable to CAMO employment
PSPMNGT610 A	Manage public sector financial resources	1	Alternative to MEA132 and MEA146

Qualification Mapping Information

Supersedes and is equivalent to MEA60211 Advanced Diploma of Aviation Maintenance Management (Mechanical)

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA60315 Advanced Diploma of Aviation Non-Destructive Testing

Modification History

Release 2 - Total number of units required to achieve qualification corrected from 'forty-one (41) to fifty (50)' to '**thirty-nine (39) to forty-eight (48)**'.

Release 1 - New qualification

Qualification Description

This qualification applies to individuals who perform aircraft and aircraft component non-destructive testing (NDT), develop NDT techniques and provide training in NDT in accordance with *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* at Level 3. The qualification also meets the regulatory requirements of the Civil Aviation Safety Authority (CASA) and of the Australian Defence Force (ADF).

The requirement for the awarding of MEA60315 Advanced Diploma of Aviation Non-Destructive Testing is demonstrated competency in listed units of competency under the conditions set out below. It consists of core units and electives chosen from Electives Group A.

Core units include:

- preliminary common and technical stream units for individuals who do not have a Certificate IV in Aeroskills or the Diploma of Aeroskills (Non-Destructive Testing)
- mandatory units consisting of:
 - common and technical stream units that relate to the aviation maintenance environment
 - technical stream and imported units relating to the NDT work environment
 - imported units that specifically cover the competencies required to perform each relevant NDT technique to the standard specified in *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* for Level 2 and 3 personnel
 - imported units that cover competencies in the development, delivery and assessment of training.

Elective Group A units consisting of:

- common units specific to either CASA or ADF regulatory requirements
- technical stream and imported units that are applicable to various areas of employment in the NDT field at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* Level 3

Individuals who have a Certificate IV in Aeroskills and/or the Diploma of Aeroskills (Non-Destructive Testing) will already have a significant number of credits towards this qualification.

The qualification also provides credits towards the MEA60215 Advanced Diploma of Aviation Maintenance Management (Mechanical).

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA60315 Advanced Diploma of Aviation Non-Destructive Testing, competency must be demonstrated in **thirty-nine (39)** to **forty-eight (48)** units, depending on the entry level.

Core units of competency

- Individuals who do not have at least a Certificate IV in Aeroskills must complete the following **nine (9)** preliminary units.

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105

MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA340	Lay out and set up aircraft systems	MEA101, MEA107 MEA109
MEA341	Apply basic aircraft design characteristics	MEA101, MEA107 MEA109
MEA342	Apply basic aircraft power plant design characteristics	MEA101, MEA107 MEA109

- Individuals who have at least a Certificate IV in Aeroskills and those who have completed the preliminary units must complete the following **thirty-five (35)** core units.

Unit code	Unit title	Prerequisites
MEA116	Apply work health and safety procedures at supervisor level in aviation maintenance	
MEA120	Manage an aviation maintenance quality system	
MEA133	Communicate aviation technical and maintenance management knowledge	
MEA134	Establish, maintain and evaluate the organisation's work health and safety system	
MEA135	Use computers in aviation maintenance-related integrated logistic support activities	
MEA137	Write aviation technical publications	MEA135
MEA138	Perform aviation technical publication management activities	MEA137
MEA142	Manage self in the aviation maintenance environment	
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA261	Use electronic test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109

MEA705	Apply basic scientific principles and techniques in aeronautical engineering situations	MEM23004A
MEA708	Select and test aeronautical engineering materials	
MEA424	Evaluate aircraft structure non-destructive tests	MEA109, MEA133 MEM13013B MEM16010A MEM24002B MEM24004B MEM24006B MEM24008B MEM24010B MEM24012C
MEM09002B	Interpret technical drawing	
MEM09003B	Prepare basic engineering drawing	MEM09002B
MEM12003B	Perform precision mechanical measurement	MEM12023A (see Note 1)
MEM13013B	Work safely with ionising radiation	
MEM15017B	Use and maintain reference standards	MEM11011B MEM12003B MEM12004B (see Note 2) MEM12005B MEM12023A (see Note 1) MEM18001C (see Note 1) MEM18002B (see Note 1)
MEM16010A	Write reports	MEM14005A (see Note 4)
MEM23004A	Apply technical mathematics	
MEM24002B	Perform penetrant testing	MEM18001C

		(see Note 1) MEM24012C
MEM24004B	Perform magnetic particle testing	MEM18001C (see Note 1) MEM24012C
MEM24006B	Perform eddy current testing	MEM18001C (see Note 1) MEM24012C
MEM24008B	Perform ultrasonic testing	MEM18001C (see Note 1) MEM24012C
MEM24010B	Perform radiographic testing	MEM13013B MEM18001C (see Note 1) MEM24012C
MEM24011B	Establish non-destructive tests	MEM13013B MEM16010A (see Note 3) MEM18001C (see Note 1) MEM24002B MEM24004B MEM24006B MEM24008B MEM24010B MEM24012C
MEM24012C	Apply metallurgy principles	
MEM30007A	Select common engineering materials	
MEM30012A	Apply mathematical techniques in a manufacturing, engineering or related environment	
MSAENV672B	Develop workplace policy and procedures for	

	environmental sustainability	
TAEDEL402A	Plan, organise and facilitate learning in the workplace	
TAEASS401B	Plan assessment activities and processes	
TAEASS402B	Assess competence	
TAEASS403B	Participate in assessment validation	
TAEASS502B	Design and develop assessment tools	

Notes

1. MEA109 is equivalent to the following three units combined MEM12023A, MEM18001C and MEM18002B
2. MEA260 and MEA261 are together equivalent to MEM12004B
3. MEA137 is equivalent to MEM16010A
4. MEA103 is equivalent to MEM14005A

Electives units of competency

Group A

- Complete **four (4)** units chosen in accordance with the unit selection guidelines in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA112	Plan and implement civil aircraft maintenance activities	All relevant technical units	Mandatory for CASA regulatory system
MEA113	Supervise civil aircraft maintenance activities and manage human resources in the workplace	All relevant technical units	Mandatory for CASA regulatory system
MEA123	Manage aviation maintenance work environment policy and practices		

Unit code	Unit title	Prerequisites	Unit selection guidelines
MEA140	Supervise aviation maintenance teams and perform maintenance quality inspections		Mandatory for ADF regulatory system
MEM09009C	Create 2D drawings using computer aided design systems	MEM09002B MEM16008A	
MEM15010B	Perform laboratory procedures		
MEM16002C	Conduct formal interviews and negotiations		
MEM16008A	Interact with computing technology		
TAEDES401A	Design and develop learning programs		

Qualification Mapping Information

Supersedes and is equivalent to MEA60311 Advanced Diploma of Aviation Non-Destructive Testing

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA60415 Advanced Diploma of Aeronautical Engineering

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to individuals employed in senior paraprofessional engineering and in managerial positions in both the Civil Aviation Safety Authority (CASA) and Australian Defence Force (ADF) regulatory environments in the fields of aeronautical engineering and engineering management. It should also be noted that many of the positions applicable to this qualification also have airworthiness regulatory requirements regarding prior aviation experience.

There are a total of forty-four (44) units of which twenty-four (24) are core units and the remainder are electives from which units must be chosen in accordance with the selection guidance provided.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA60415 Advanced Diploma of Aeronautical Engineering, competency must be demonstrated in a total of **twenty-eight (28)** or **thirty-one (31)** units of competency, consisting of:

- **twenty-four (24)** core units
- either **four (4)** or **seven (7)** elective units chosen from Group A.

Core units of competency

Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in	

Unit code	Unit title	Prerequisites
	aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105 MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA133	Communicate aviation technical and maintenance knowledge	
MEA135	Use computers in aviation maintenance-related integrated logistic support activities	
MEA137	Write aviation maintenance technical publications	MEA135
MEA142	Manage self in the aviation maintenance environment	
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA327	Fabricate and/or repair aircraft mechanical components or parts	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA701	Produce aeronautical engineering related graphics	MEA137 MEM30007A MEM30012A
MEA703	Apply aeronautical modelling for computer aided engineering	MEA701
MEA705	Apply basic scientific principles and techniques in aeronautical engineering situations	MEM23004A

Unit code	Unit title	Prerequisites
MEA707	Select and test aeronautical engineering materials	
MEA709	Apply aeronautical structure design techniques	MEA701, MEA703 MEA705, MEA707 MEM23004A MEM23007A
MEA710	Apply aeronautical system design techniques	MEA701, MEA703 MEA705 MEM23004A
MEA713	Integrate aeronautical fundamentals into an engineering task	MEA705 MEM23004A MEM23007A
MEM23004A	Apply technical mathematics	
MEM23007A	Apply calculus to engineering tasks	MEM23004A
MEM30007A	Select common engineering materials	
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	

Elective units of competency

Group A

- Take either **four (4)** or, where either the Diploma of Aeronautical Engineering or the Certificate IV in Aeroskills (Mechanical) is not held, **seven (7)** of the elective units listed below. Units should be selected, where applicable, using the guidance in column 4.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA127	Provide technical advice in the maintenance and management of aircraft and aeronautical product	MEA705 MEA707	Applicable to the CASA regulatory environment

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA128	Provide engineering advice in the modification, maintenance and management of aircraft systems	MEA705, MEA707	Applicable to the ADF regulatory environment
MEA129	Investigate technical aspects of aviation occurrences		Applicable to the ADF regulatory environment
MEA143	Develop and manage maintenance error management programs		Applicable to the CASA regulatory environment
MEA147	Perform airworthiness management and maintenance program tasks	MEA137	Applicable to the CASA regulatory environment
MEA340	Lay out and set up aircraft systems	MEA101, MEA107 MEA109	Must be taken if Certificate IV in Aeroskills (Mechanical) or Diploma of Aeronautical Engineering is not held
MEA341	Apply basic aircraft design characteristics	MEA101, MEA107 MEA109	Must be taken if Certificate IV in Aeroskills (Mechanical) or Diploma of Aeronautical Engineering is not held
MEA342	Apply basic aircraft power plant design characteristics	MEA101, MEA107 MEA109	Must be taken if Certificate IV in Aeroskills (Mechanical) or Diploma of Aeronautical Engineering is not held
MEA715	Evaluate aeroplane flight	MEA710	Choose in

Unit code	Unit title	Prerequisites	Unit selection guidance
	control systems	MEM23004A MEM23007A	accordance with employment field
MEA718	Evaluate rotorcraft flight control systems	MEA710 MEM23004A MEM23007A	Choose in accordance with employment field
MEA720	Evaluate aircraft gas turbine engine power plants	MEA710 MEM23004A MEM23007A	Choose in accordance with employment field
MEA721	Evaluate aircraft hydro-mechanical systems	MEA710 MEM23004A MEM23007A	Choose in accordance with employment field
MEA722	Evaluate aircraft piston engine power plants	MEA710, MEM23004A MEM23007A	Choose in accordance with employment field
MEA723	Evaluate aircraft pneumatic systems	MEA710 MEM23004A MEM23007A	Choose in accordance with employment field
MEA724	Evaluate aircraft structure	MEA709 MEM234019A MEM234022A	Choose in accordance with employment field
MEA729	Apply configuration management procedures in airworthiness engineering management	MEA135, MEA138	Choose in accordance with employment field
MEA730	Apply systems engineering procedures to airworthiness engineering design project management	MEA135, MEA137	Choose in accordance with employment field
MEM22013A	Coordinate engineering projects		
MEM234019A	Apply finite element analysis		Required if

Unit code	Unit title	Prerequisites	Unit selection guidance
	in engineering design		MEA724 is taken
MEM234022A	Apply advanced calculus to technology problems		Required if MEA724 is taken

Qualification Mapping Information

No equivalent qualification

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA60515 Advanced Diploma of Avionic Engineering

Modification History

Release 1 - New qualification

Qualification Description

This qualification applies to individuals employed in senior paraprofessional engineering and in managerial positions in both the Civil Aviation Safety Authority (CASA) and the Australian Defence Force (ADF) regulatory environments in the fields of avionic engineering and engineering management. It should also be noted that many of the positions applicable to this qualification also have airworthiness regulatory requirements regarding prior aviation experience.

There are a total of forty-three (44) units of which twenty-eight (28) are core units and the remainder are electives from which units must be chosen in accordance with the selection guidance provided.

This qualification applies to workplaces that operate under the airworthiness regulatory systems of the ADF and CASA. Any regulatory/licensing requirements associated with any MEA units of competency must be met.

Entry Requirements

Not applicable

Packaging Rules

To be awarded the MEA60515 Advanced Diploma of Avionic Engineering, competency must be demonstrated in a total of **thirty-two (32)** or **thirty-four (34)** units of competency, consisting of:

- **twenty-eight (28)** core units
- **four (4)** or **six (6)** elective units from Group A chosen in accordance with the unit selection guidelines.

Core units of competency

Unit code	Unit title	Prerequisites
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Unit code	Unit title	Prerequisites
MEA101	Interpret work health and safety practices in aviation maintenance	
MEA103	Plan and organise aviation maintenance work activities	MEA101, MEA105, MEA107, MEA108
MEA105	Apply quality standards applicable to aviation maintenance processes	MEA101, MEA107
MEA107	Interpret and use aviation maintenance industry manuals and specifications	
MEA108	Complete aviation maintenance industry documentation	MEA105
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance	MEA105, MEA108
MEA133	Communicate aviation technical and maintenance knowledge	
MEA135	Use computers in aviation maintenance-related integrated logistic support activities	
MEA137	Write aviation maintenance technical publications	MEA135
MEA142	Manage self in the aviation maintenance environment	
MEA201	Remove and install miscellaneous aircraft electrical hardware/components	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA246	Fabricate and/or repair aircraft electrical hardware or parts	MEA201, MEA260
MEA260	Use electrical test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA261	Use electronic test equipment	MEA101, MEA103 MEA105, MEA107 MEA108, MEA109
MEA262	Modify/repair single layer printed circuit boards	MEA260, MEA261

Unit code	Unit title	Prerequisites
MEA702	Produce aeronautical engineering related graphics	MEA137 MEM30007A MEM300012A
MEA704	Apply avionic modelling for computer-aided engineering	MEA702
MEA706	Apply basic scientific principles and techniques in avionic engineering situations	MEM23004A
MEA708	Select and test avionic engineering materials	
MEA711	Apply avionic analogue design techniques	MEA702, MEA708 MEA714, MEA725
MEA712	Apply avionic digital design techniques	MEA702, MEA708 MEA714, MEA725
MEA714	Integrate avionic fundamentals into an engineering task	MEA706, and MEM23004A, Plus MEM23007A OR MEA726
MEA725	Apply advanced scientific principles and techniques in avionic engineering situations	MEA706, MEA727
MEA727	Apply calculus in avionic engineering situations	MEM23004A
MEM30007A	Select common engineering materials	
MEM23004A	Apply technical mathematics	
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	

Elective units of competency

Group A

- Take **four (4)** of the elective Advanced Diploma/Diploma common and paraprofessional engineering units listed below. Where applicable, units should be selected using the guidance in column 4. In addition, take the **two (2)** additional units as indicated if either the Diploma of Avionic Engineering or the Certificate IV in Aeroskills (Avionics) is not held.

Unit code	Unit title	Prerequisites	Unit selection guidance
MEA127	Provide technical advice in the maintenance and management of aircraft and aeronautical product	MEA706, MEA708	Applicable to the CASA regulatory environment
MEA128	Provide engineering advice in the modification, maintenance and management of aircraft systems	MEA706, MEA708	Applicable to the ADF regulatory environment
MEA129	Investigate technical aspects of aviation occurrences		Applicable to the ADF regulatory environment
MEA138	Perform aviation technical publication management activities	MEA137	
MEA143	Develop and manage maintenance error management programs		Applicable to the CASA regulatory environment
MEA147	Perform airworthiness management and maintenance program tasks	MEA137	Applicable to the CASA regulatory environment
MEA270	Lay out avionic systems	MEA101, MEA107 MEA109	Must be taken if Certificate IV in Aeroskills (Avionics) or the Diploma of Avionic Engineering is not held
MEA271	Lay out avionic flight management systems	MEA101, MEA107 MEA109, MEA270	Must be taken if Certificate IV in Aeroskills

Unit code	Unit title	Prerequisites	Unit selection guidance
			(Avionics) or the Diploma of Avionic Engineering is not held
MEA716	Evaluate avionic analogue systems	MEA711, MEA727	
MEA717	Evaluate avionic digital systems	MEA712, MEA727	
MEA719	Evaluate aircraft electrical systems	MEA726	
MEA726	Apply aircraft electrical system design techniques	MEA702, MEA706 MEA708, MEA714 MEA725	
MEA729	Apply configuration management procedures in airworthiness engineering management	MEA135, MEA138	
MEA730	Apply systems engineering procedures to airworthiness engineering design project management	MEA135, MEA137	
MEM22013A	Coordinate engineering projects		

Qualification Mapping Information

No equivalent qualification

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

AURVTP2003 Prepare spray painting materials and equipment

Modification History

Release	Comment
Release 1	Replaces AURV229749A Prepare spray painting materials and equipment Unit code updated to meet policy requirements Reference to OHS legislation replaced with new WHS legislation Licensing statement added to unit descriptor

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge required to prepare spray painting materials and equipment for use. Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.
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Application of the Unit

Application of the unit	The unit includes identification and confirmation of work requirements, preparation for work, preparation of paint for spray guns, preparation of guns and associated equipment, and completion of work finalisation processes, including clean-up and documentation. Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	<p>1.1. Work instructions are used to determine job requirements, including method and material type.</p> <p>1.2. Job specifications are read and interpreted.</p> <p>1.3. Workplace health and safety (WHS) requirements, including personal protection needs, are observed throughout the work.</p> <p>1.4. Materials are selected and inspected for quality.</p> <p>1.5. Hand, power tooling and safety equipment are identified and checked for operation.</p> <p>1.6. Procedures are determined to minimise waste material.</p> <p>1.7. Procedures are identified for maximising energy efficiency while completing the job.</p>
2. Prepare paint for spray gun(s)	<p>2.1. Information is accessed and interpreted from manufacturer/ component supplier specifications.</p> <p>2.2. Paints are mixed to conform to specification for type and colour, viscosity and temperature.</p> <p>2.3. A test card is used for comparison of colour and</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>texture.</p> <p>2.4.Preparation activities are carried out according to industry regulations/guidelines, WHS requirements, legislation and enterprise procedures/policies.</p> <p>2.5.Paint is prepared without causing damage to component or system.</p> <p>2.6.Waste materials are stored and/or disposed of in accordance with statutory and enterprise requirements.</p>
3. Prepare spray gun(s) for spraying	<p>3.1.Information is accessed and interpreted from manufacturer/ component supplier specifications.</p> <p>3.2.Preparation, maintenance and adjustment of spray painting equipment conforms to requirements of manufacturer/component supplier specifications.</p> <p>3.3.Preparation activities are carried out according to industry regulations/guidelines, WHS requirements, legislation and enterprise procedures/policies.</p> <p>3.4.Spray guns are prepared without causing damage to component or system.</p>
4. Clean up work area and maintain equipment	<p>4.1.Material that can be reused is collected and stored.</p> <p>4.2.Waste and scrap is removed following workplace procedures.</p> <p>4.3.Equipment and work area are cleaned and inspected for serviceable condition in accordance with workplace procedures.</p> <p>4.4.Unserviceable equipment is tagged and faults identified in accordance with workplace procedures.</p> <p>4.5.Operator maintenance is completed in accordance with manufacturer/component supplier specifications and worksite procedures.</p> <p>4.6.Tooling is maintained in accordance with workplace procedures.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Required skills include:

- collect, organise and understand information related to work orders, plans and safety procedures for preparing spray painting material and equipment
- communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with worksite supervisor, other workers and customers, and the reporting of work outcomes and problems
- plan and organise activities, including preparation and layout of worksite and obtaining of equipment and material to avoid backtracking, workflow interruptions or wastage
- work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- use mathematical ideas and techniques to calculate time, apply accurate measurements, calculate material requirements and establish quality checks
- establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimise reworking and wastage
- use workplace technology related to the preparation of spray painting material and equipment, including the use of specialist tooling, measuring equipment and communication devices and the reporting/documenting of results

Required knowledge

Required knowledge includes:

- WHS cleaning materials, equipment, material and personal safety requirements
- environmental protection requirements
- material storage, handling and disposal/material safety data sheets
- types of paints, including acrylic lacquers, solids, clear over base, air dry and polyurethane, and two component systems
- paint application methods
- spray guns and their application
- manufacturer/component supplier specifications for spray gun set-up and maintenance
- equipment preparation procedures
- paint mixing techniques
- paint drying methods
- work organisation and planning processes
- enterprise quality processes

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of:</p> <ul style="list-style-type: none"> • observing safety procedures and requirements • communicating effectively with others involved in or affected by the work • selecting methods and techniques appropriate to the circumstances • completing preparatory activity in a systematic manner • applying environmental procedures • preparing automotive paint to specifications • preparing spray guns and associated equipment to manufacturer/component supplier requirements.
Context of, and specific resources for assessment	<ul style="list-style-type: none"> • Application of competence is to be assessed in the workplace or simulated worksite. • Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints. • Assessment is to comply with regulatory requirements, including Australian Standards. • The following resources should be made available: <ul style="list-style-type: none"> • workplace location or simulated workplace • material relevant to the preparation of spray painting material and equipment • equipment, hand and power tooling appropriate to the preparation of spray painting material and equipment • activities covering mandatory task requirements • specifications and work instructions.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed Assessment Guidelines of the Automotive Industry Retail, Service and Repair Training Package. • Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge.

EVIDENCE GUIDE

	<ul style="list-style-type: none"> • Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies. • Assessment may be applied under project-related conditions and require evidence of process. • Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements. • Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.
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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.

Methods

Methods are to include:

- spray gun techniques
- various spraying techniques
- drying procedures
- paint mixing methods
- paint straining methods
- paint thinning methods

WHS

WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include:

RANGE STATEMENT	
	<ul style="list-style-type: none"> • protective clothing and equipment • use of tooling and equipment • workplace environment and safety • handling of material • use of firefighting equipment • enterprise first aid • hazard control and hazardous material and substances
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices
Safe operating procedures	<p>Safe operating procedures are to include, but are not limited to:</p> <ul style="list-style-type: none"> • operational risk assessment and treatments associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and worksite visitors
Emergency procedures	<p>Emergency procedures related to this unit are to include, but are not limited to:</p> <ul style="list-style-type: none"> • emergency shutdown and stopping of equipment • extinguishing fires • enterprise first aid requirements • worksite evacuation
Environmental requirements	<p>Environmental requirements are to include, but are not limited to:</p> <ul style="list-style-type: none"> • waste management, noise, dust and clean-up management
Quality requirements	<p>Quality requirements are to include, but are not limited to:</p> <ul style="list-style-type: none"> • regulations, including Australian standards • internal company quality policies and standards • enterprise operations and procedures
Statutory/regulatory authorities	<p>Statutory/regulatory authorities may include:</p> <ul style="list-style-type: none"> • federal, state/territory and local authorities

RANGE STATEMENT	
	administering Acts, regulations and codes of practice
Tooling and equipment	<p>Tooling and equipment may include:</p> <ul style="list-style-type: none"> • tinting machines • microfiche, scales • air-operated agitators • hand paddles • mixing banks • spray gun stem strainers • funnel strainers • mesh strainers • nylon stocking weave • vacuum paint strainers • viscosity measuring equipment • high-volume low-pressure spray guns • gravity feed spray guns • suction feed spray guns • pressure regulators • air compressors • spray booths • baking ovens • heating and lighting systems
Materials	<p>Materials may include:</p> <ul style="list-style-type: none"> • acrylic lacquers • air dry synthetic enamels • two-pack urethane acrylic enamels • metallic two-pack enamels • clear acrylic lacquers • metallic acrylic lacquers • pearl finishes • water-based finishes • paint thinners and paint reducers
Communications	<p>Communications are to include, but are not limited to:</p> <ul style="list-style-type: none"> • verbal and visual instructions and fault reporting and may include worksite specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers

RANGE STATEMENT

Information/documents	<p>Sources of information/documents may include:</p> <ul style="list-style-type: none"> • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets (MSDS), diagrams or sketches • safe work procedures related to the preparation of spray painting material and equipment • regulatory/legislative requirements pertaining to automotive painting and finishing • engineer's design specifications and instructions • organisation work specifications and requirements • instructions issued by authorised enterprise or external persons • Australian standards
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Unit Sector(s)

Unit sector	Vehicle body
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Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Paint
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AURVTP3012 Apply air dry and polyurethane enamel refinishing materials

Modification History

Release	Comment
Release 1	<p>Replaces AURV329603DA Apply air dry and polyurethane enamel refinishing materials</p> <p>Unit code updated to meet policy requirements</p> <p>Reference to OHS legislation replaced with new WHS legislation</p> <p>Licensing statement added to unit descriptor</p>

Unit Descriptor

Unit descriptor	<p>This unit covers the competence required to apply air dry and polyurethane enamel refinishing materials to a variety of vehicle substrates by spray gun application and determine causes and rectification procedures for paint finish faults.</p> <p>Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.</p>
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Application of the Unit

Application of the unit	<p>The unit includes identification and confirmation of work requirement, preparation for work, application of materials, the rectification of faults and completion of work finalisation processes, including clean-up and documentation.</p> <p>Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	<p>1.1. Work instructions are used to determine the job requirements, including job sheets, material type, colour, quality and quantity.</p> <p>1.2. Job specifications are read and interpreted.</p> <p>1.3. WHS requirements, including personal protection needs, breathing apparatus and full body protection, are observed throughout the work.</p> <p>1.4. Materials are selected and inspected for quality.</p> <p>1.5. Hand tooling and safety equipment are identified and checked for operation.</p> <p>1.6. Procedures are determined to minimise waste material.</p> <p>1.7. Procedures are identified for maximising energy efficiency while completing the job.</p>

ELEMENT	PERFORMANCE CRITERIA
2. Identify paint faults, causes and rectification procedures	<p>2.1. Paint faults are identified according to industry and workplace procedures.</p> <p>2.2. Paint fault causes are determined according to industry and workplace procedures.</p> <p>2.3. Rectification procedures are determined according to fault and type of finish material according to industry standard practices and workplace requirements.</p> <p>2.4. Identification and determination activities are carried out according to industry regulations/guidelines, WHS legislation, and enterprise procedures/policies.</p>
3. Apply air dry and polyurethane enamel refinishing materials by spray gun	<p>3.1. The environment for application of refinishing materials conforms to requirements for temperature, extraction of fumes and cleanliness.</p> <p>3.2. Refinishing materials are applied at manufacturer/component supplier recommended intervals using approved methods.</p> <p>3.3. Refinishing materials are dried using approved methods and equipment.</p> <p>3.4. Refinishing materials are applied without causing damage to any component or system.</p> <p>3.5. The finish produced meets specifications for colour, texture, depth and gloss and is contaminant-free.</p> <p>3.6. Surface refinishing is completed within approved timeframes.</p> <p>3.7. Application activities are carried out according to industry regulations/guidelines, WHS legislation, and enterprise procedures/policies.</p>
4. Clean up work area and maintain equipment	<p>4.1. Material that can be reused is collected and stored.</p> <p>4.2. Waste material is removed and disposed of or stored according to statutory and workplace procedure.</p> <p>4.3. Spray equipment is cleaned as specified by manufacturer/component supplier and/or workplace policy and procedures.</p> <p>4.4. Work area is cleaned and inspected for serviceable condition in accordance with workplace procedures.</p> <p>4.5. Unserviceable equipment is tagged and faults identified in accordance with workplace procedures.</p> <p>4.6. Operator maintenance is completed in accordance with manufacturer/component supplier specifications and worksite procedures.</p> <p>4.7. Tooling is maintained in accordance with workplace</p>

ELEMENT	PERFORMANCE CRITERIA
	procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- collect, organise and understand information related to work orders, plans and safety procedures for applying air dry and polyurethane enamel refinishing materials
- communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with worksite supervisor, other workers and customers, and the reporting of work outcomes and problems
- plan and organise activities, including preparation and layout of worksite and obtaining of equipment and materials to avoid backtracking, workflow interruptions or wastage
- work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimise reworking and avoid wastage
- use mathematical ideas and techniques to calculate time, apply accurate measurements, calculate material requirements and establish quality checks
- use workplace technology related to application of air dry and polyurethane enamel refinishing materials, including the use of specialist equipment, measuring equipment and communication devices and the reporting/recording of results

Required knowledge

A working knowledge of:

- WHS regulations/requirements, equipment, material and personal safety requirements
- environmental protection requirements/substance disposal and storage requirements
- material safety data sheets
- types of air dry and polyurethane enamel refinishing materials
- application methods
- paint surface fault identification and rectification procedures
- drying methods for air dry and polyurethane enamel refinishing material

REQUIRED SKILLS AND KNOWLEDGE

- types of spray guns
- spray gun operation and spraying techniques
- spray gun cleaning methods
- work organisation and planning processes
- enterprise quality processes

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**Critical aspects for assessment and evidence required to demonstrate competency in this unit**

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of:

- observing safety procedures and requirements
- communicating effectively with others involved in or affected by the work
- selecting methods and techniques appropriate to the circumstances
- completing preparatory activity in a systematic manner
- preparing air dry and polyurethane enamel paint
- applying a range of air dry and polyurethane enamel refinishing materials
- identifying paint faults and determining rectification faults
- rectifying faults
- applying environmental procedures.

Context of, and specific resources for assessment

Application of competence is to be assessed in the workplace or simulated worksite.

Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.

Assessment is to comply with regulatory requirements, including Australian Standards. The following resources should be made available:

- workplace location or simulated workplace
- materials relevant to application of air dry and

EVIDENCE GUIDE	
	<p>polyurethane enamel refinishing materials</p> <ul style="list-style-type: none"> • equipment, hand and power tooling appropriate to application of air dry and polyurethane enamel refinishing materials • activities covering mandatory task requirements • specifications and work instructions.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed assessment guidelines of the automotive industry's RS&R Training Package. • Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. • Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies. • Assessment may be applied under project related conditions and require evidence of process. • Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements. • Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.
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. **Essential** italicised wording, if used in the performance criteria, is detailed below. Essential

RANGE STATEMENT	
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.	
Paint types	Paint types are to include air dry synthetic enamels, enamel additives, two-pack polyurethane acrylic enamels, urethane additives and paint reducers.
Methods	Methods are to include: <ul style="list-style-type: none"> • spray gun selection, various spraying techniques, drying procedures, paint mixing • polishing and detailing of surfaces.
WHS	WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of materials, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances.
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices.
Safe operating procedures	Safe operating procedures are to include, but are not limited to operational risk assessment and treatments associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and worksite visitors.
Emergency procedures	Emergency procedures related to this unit are to include, but are not limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and worksite evacuation.
Environmental requirements	Environmental requirements are to include but are not limited to waste management, noise, dust and clean-up management.

RANGE STATEMENT	
Quality requirements	Quality requirements are to include, but are not limited to regulations, including Australian Standards, internal company quality policy and standards and enterprise operations and procedures.
Statutory/regulatory authorities	Statutory/regulatory authorities may include Federal, State/Territory and local authorities administering acts, regulations and codes of practice.
Tooling and equipment	Tooling and equipment may include various spray guns, air pressure regulators, air compressors, spray booths, baking ovens, heating and lighting systems, strainers, masking equipment and safety equipment.
Materials	Materials may include rags, tac rags, cleaning solvents and cleaning materials.
Communications	Communications are to include, but are not limited to verbal and visual instructions and fault reporting and may include worksite specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers.
Information/documents	<p>Sources of information/documents may include:</p> <ul style="list-style-type: none"> • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets, diagrams or sketches • safe work procedures related to application of air dry and polyurethane enamel refinishing materials • regulatory/legislative requirements pertaining to automotive painting and finishing • engineer's design specifications and instructions • organisation work specifications and requirements • instructions issued by authorised enterprise or external persons • Australian Standards.

Unit Sector(s)

Unit sector	Vehicle body
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Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Paint
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AURVTT2004 Trim vehicle components

Modification History

Release	Comment
Release 1	<p>Replaces AURV231208A Carry out trimming of vehicle components</p> <p>Unit code updated to meet policy requirements</p> <p>Minor changes to unit title</p> <p>Reference to OHS legislation replaced with new WHS legislation</p> <p>Licensing statement added to unit descriptor</p>

Unit Descriptor

Unit descriptor	<p>This unit of competency covers the skills and knowledge required to measure, cut, fabricate and attach material covers to vehicle components.</p> <p>Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.</p>
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Application of the Unit

Application of the unit	<p>The unit includes identification and confirmation of work requirements, preparation for work, matching, measuring, cutting, fabricating and attaching of material covers to vehicle components, and completion of work finalisation processes, including clean-up and documentation.</p> <p>Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	<p>1.1. Work instructions are used to determine job requirements, including method, process and equipment.</p> <p>1.2. Job specifications are read and interpreted.</p> <p>1.3. Workplace health and safety (WHS) requirements, including personal safety needs, are observed throughout the work.</p> <p>1.4. Equipment and tooling are identified and checked for safe and effective operation.</p> <p>1.5. Procedures are determined to minimise task time.</p>
2. Match material	<p>2.1. Information is accessed and interpreted from manufacturer/ component supplier specifications.</p> <p>2.2. Matching procedures are carried out in accordance with manufacturer/component supplier</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>specifications.</p> <p>2.3. Matching procedures are completed within established industry enterprise guidelines.</p> <p>2.4. Activities are carried out according to industry regulations/ guidelines, WHS requirements, legislation and enterprise procedures/policies.</p>
3. Measure and cut material	<p>3.1. Information is accessed and interpreted from manufacturer/ component supplier specifications.</p> <p>3.2. Measuring and cutting procedures are carried out in accordance with manufacturer/component supplier specifications.</p> <p>3.3. Measuring and cutting procedures are completed within established industry enterprise guidelines.</p> <p>3.4. Activities are carried out according to industry regulations/ guidelines, WHS requirements, legislation and enterprise procedures/policies.</p>
4. Fabricate trim/covers to suit vehicle/ components	<p>4.1. Information is accessed and interpreted from manufacturer/ component supplier specifications.</p> <p>4.2. Trim/cover fabrication procedures are carried out in accordance with manufacturer/component supplier specifications.</p> <p>4.3. Fabrication procedures are completed within established industry enterprise guidelines.</p> <p>4.4. Activities are carried out according to industry regulations/guidelines, WHS requirements, legislation and enterprise procedures/policies.</p>
5. Attach material cover to vehicle/component	<p>5.1. Information is accessed and interpreted from manufacturer/ component supplier specifications.</p> <p>5.2. Attaching procedures are carried out in accordance with manufacturer/component supplier specifications.</p> <p>5.3. Attaching procedures are completed within established industry/enterprise guidelines.</p> <p>5.4. Activities are carried out according to industry regulations/ guidelines, WHS requirements, legislation and enterprise procedures/policies.</p>
6. Clean up work area and maintain equipment	<p>6.1. Material that can be reused is collected and stored.</p> <p>6.2. Waste and scrap is removed following workplace procedure.</p> <p>6.3. Equipment and work area are cleaned and inspected for serviceable condition in accordance with</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>workplace procedures.</p> <p>6.4. Unserviceable equipment is tagged and faults identified in accordance with workplace requirements.</p> <p>6.5. Operator maintenance is completed in accordance with manufacturer/component supplier specifications and worksite procedures.</p> <p>6.6. Tooling and equipment is maintained in accordance with workplace procedures.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- collect, organise and understand information related to work orders, plans and safety procedures for trimming of vehicle components
- technical literacy and communication skills sufficient to interpret and apply common industry terminology, and interpret technical information and specifications
- research and interpretive skills to locate, interpret and apply operational and safety information
- communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with worksite supervisor, other workers and customers, and the reporting of work outcomes and problems
- plain English literacy and communication skills in relation to dealing with others involved in the work
- questioning and active listening skills, for example when obtaining information regarding trimming requirements
- plan and organise activities, including preparation and layout of worksite and obtaining of equipment and material to avoid backtracking or workflow interruptions
- work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- use mathematical ideas and techniques to complete tests and measurements to determine trimming requirements
- use pre-checking and inspection techniques to anticipate planning and scheduling

REQUIRED SKILLS AND KNOWLEDGE

problems, avoid wastage of time and material

- manipulative and dexterity skills to perform trimming activities
- problem-solving skills for a range of differing procedural issues
- use workplace technology related to carrying out trimming of vehicle components, including the use of specialist tooling, measuring equipment and communication devices and the reporting/documenting of results

Required knowledge

Required knowledge includes:

- WHS cleaning materials, equipment, material and personal safety requirements
- removal and replacement methods
- measuring/testing and adjustment procedures
- technical and legal requirements
- manufacturer/component supplier/company policies
- types and uses of various materials
- trim fabrication, matching, measuring and cutting procedures
- use of tooling and equipment
- work organisation and planning processes
- enterprise quality processes

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of:

- observing safety procedures and requirements
- communicating effectively with others involved in or affected by the work
- selecting methods and techniques appropriate to the circumstances
- completing preparatory activity in a systematic manner

EVIDENCE GUIDE	
	<ul style="list-style-type: none"> • fabricating covers/trims • repairing material covers/trims • replacing material covers/trims • adjusting material covers/trims • completing workplace records.
Context of, and specific resources for assessment	<ul style="list-style-type: none"> • Application of competence is to be assessed in the workplace or simulated worksite. • Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints. • Assessment is to comply with regulatory requirements, including Australian Standards. • The following resources should be made available: <ul style="list-style-type: none"> • workplace location or simulated workplace • material relevant to carrying out trimming of vehicle components • equipment, hand and power tooling appropriate to carrying out trimming of vehicle components • activities covering mandatory task requirements • specifications and work instructions.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed Assessment Guidelines of the Automotive Industry Retail, Service and Repair Training Package. • Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. • Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies. • Assessment may be applied under project-related conditions and require evidence of process. • Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements. • Competence in this unit may be assessed in conjunction

EVIDENCE GUIDE

	with other functional units which together form part of the holistic work role.
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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.

Trimming methods

Trimming methods are to include:

- sewing, gluing, riveting, cutting, forming and stapling

Vehicles

Vehicles may include:

- marine craft aircraft
- light and heavy vehicles and equipment

WHS

WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include:

- protective clothing and equipment
- use of tooling and equipment
- workplace environment and safety
- handling of material
- use of firefighting equipment
- enterprise first aid
- hazard control and hazardous material and substances

Personal protective equipment

Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices

Safe operating procedures

Safe operating procedures are to include, but are not limited to:

- operational risk assessment and treatments

RANGE STATEMENT	
	associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and worksite visitors.
Emergency procedures	Emergency procedures related to this unit are to include, but are not limited to: <ul style="list-style-type: none"> • emergency shutdown and stopping of equipment • extinguishing fires • enterprise first aid requirements • worksite evacuation
Environmental requirements	Environmental requirements are to include but are not limited to waste management, noise, dust and clean-up management
Quality requirements	Quality requirements are to include, but are not limited to: <ul style="list-style-type: none"> • regulations, including Australian standards • internal company quality policies and standards • enterprise operations and procedures
Statutory/regulatory authorities	Statutory/regulatory authorities may include: <ul style="list-style-type: none"> • federal, state/territory and local authorities administering Acts, regulations and codes of practice
Tooling and equipment	Tooling and equipment may include: <ul style="list-style-type: none"> • hand tooling • power/air tooling • specialist tooling for dismantling/assembly • staple gun • hammers • wad punches • heat gun • foam cutter • scissors and knives • revolving hole punch • ruler and tape • hand clamps

RANGE STATEMENT	
	<ul style="list-style-type: none"> • adhesive gun • pop rivet kit • punch and die set • hog ring pliers • door handle remover • hacksaw • sander • staple and tack remover • scrapers and putty knives • stuffing irons • vacuum formers
Materials	<p>Materials may include:</p> <ul style="list-style-type: none"> • fabrics and cleaning materials
Communications	<p>Communications are to include, but are not limited to:</p> <ul style="list-style-type: none"> • verbal and visual instructions and fault reporting and may include worksite specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers
Information/documents	<p>Sources of information/documents may include:</p> <ul style="list-style-type: none"> • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets (MSDS), diagrams or sketches • Safe work procedures related to carrying out trimming of vehicle components • Regulatory/legislative requirements pertaining to automotive industry, including Australian Design Rules • Engineer's design specifications and instructions • Organisation work specifications and requirements • Instructions issued by authorised enterprise or external persons • Australian standards

Unit Sector(s)

Unit sector	Vehicle body
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Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Trimming and Upholstery
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AURVTT2005 Select and apply trim and fabric materials

Modification History

Release	Comment
Release 1	<p>Replaces AURV231268A Select and apply trim/fabric materials and determine attachment methods</p> <p>Unit code updated to meet policy requirements</p> <p>Minor changes to unit title</p> <p>Reference to OHS legislation replaced with new WHS legislation</p> <p>Licensing statement added to unit descriptor</p>

Unit Descriptor

Unit descriptor	<p>This unit of competency covers the skills and knowledge required to select trim/fabric materials and determine methods of attaching trim/fabric materials.</p> <p>Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.</p>
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Application of the Unit

Application of the unit	<p>The unit includes identification and confirmation of work requirements, preparation for work, selection of trim/fabric material for specific applications, selection of the methods of attachment of material to vehicle components, and completion of work finalisation processes, including clean-up and documentation.</p> <p>Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Work instructions are used to determine job requirements, including method, process and equipment. 1.2. Job specifications are read and interpreted. 1.3. Workplace health and safety (WHS) requirements, including personal safety needs, are observed throughout the work. 1.4. Equipment and tooling are identified and checked for safe and effective operation. 1.5. Procedures are determined to minimise task time.
2. Select trim/fabric materials	2.1. Information is accessed and interpreted from manufacturer/ component supplier specifications. 2.2. Material applications and usages are compared with the job requirements.

ELEMENT	PERFORMANCE CRITERIA
	<p>2.3. The material selected is that which best meets the user requirement.</p> <p>2.4. Activities are carried out according to industry regulations/ guidelines, WHS requirements, legislation and enterprise procedures/policies.</p>
3. Determine attachment methods	<p>3.1. Information is accessed and interpreted from manufacturer/ component supplier specifications.</p> <p>3.2. Attachment options are identified and analysed.</p> <p>3.3. Attachment option is selected.</p> <p>3.4. Selected option is documented.</p>
4. Clean up work area and maintain equipment	<p>4.1. Equipment and work area are cleaned and inspected for serviceable condition in accordance with workplace procedures.</p> <p>4.2. Operator maintenance is completed in accordance with manufacturer/component supplier specifications and worksite procedures.</p> <p>4.3. Equipment is maintained in accordance with workplace procedures.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- collect, organise and understand information related to work orders, plans and safety procedures for selection and application of trim/fabric materials
- technical literacy and communication skills sufficient to interpret and apply common industry terminology, and interpret technical information and specifications
- research and interpretive skills to locate, interpret and apply operational and safety information
- communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with worksite supervisor, other workers and customers, and the reporting of work outcomes and problems
- plain English literacy and communication skills in relation to dealing with others involved in the work

REQUIRED SKILLS AND KNOWLEDGE

- questioning and active listening skills, for example when obtaining information relating to selection and application of trim/fabric materials
- plan and organise activities, including preparation and layout of worksite and obtaining of equipment and material to avoid backtracking or workflow interruptions
- work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- use mathematical ideas and techniques to complete tests and measurements to determine selection and application of trim/fabric materials
- establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimise reworking and wastage
- use workplace technology related to selection and application of trim/fabric materials, including the use of measuring equipment, computerised technology and communication devices and the reporting/documenting of results

Required knowledge

Required knowledge includes:

- WHS cleaning materials, equipment, material and personal safety requirements
- manufacturer/component supplier/company specifications
- trim/fabric material types and their application
- selection procedures to determine trim/fabric material requirements
- methods of attachment of trim/fabric materials
- work organisation and planning processes
- enterprise quality processes

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of:

- observing safety procedures and requirements
- communicating effectively with others involved in or

EVIDENCE GUIDE	
	<p>affected by the work</p> <ul style="list-style-type: none"> • completing preparatory activity in a systematic manner • selecting trim/fabric materials for a range of specified jobs • determine attachment methods to be used for a range of specified jobs.
Context of, and specific resources for assessment	<ul style="list-style-type: none"> • Application of competence is to be assessed in the workplace or simulated worksite. • Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints. • Assessment is to comply with regulatory requirements, including Australian Standards. • The following resources should be made available: <ul style="list-style-type: none"> • workplace location or simulated workplace • materials relevant to selection and determination of attachment methods of trim/fabric materials • equipment, hand and power tooling appropriate to selection and determination of attachment methods of trim/fabric materials • activities covering mandatory task requirements • specifications and work instructions.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed Assessment Guidelines of the Automotive Industry Retail, Service and Repair Training Package. • Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. • Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also reinforce the integration of key competencies. • Assessment may be applied under project-related conditions and require evidence of process. • Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements.

EVIDENCE GUIDE

	<ul style="list-style-type: none"> Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.
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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.

Methods

Methods to be considered are to include:

- clamping, crimping, gluing and sewing

Trim/fabric materials

Trim/fabric materials may be attached to:

- passenger/commercial vehicles
- plant and agricultural equipment
- recreational equipment
- mining equipment
- marine craft and aircraft

WHS

WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include:

- protective clothing and equipment
- use of tooling and equipment
- workplace environment and safety
- handling of material
- use of firefighting equipment
- enterprise first aid
- hazard control and hazardous material and substances

Personal protective equipment

Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices

RANGE STATEMENT	
Safe operating procedures	<p>Safe operating procedures are to include, but are not limited to:</p> <ul style="list-style-type: none"> operational risk assessment and treatments associated with electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and worksite visitors
Emergency procedures	<p>Emergency procedures related to this unit are to include, but are not limited to:</p> <ul style="list-style-type: none"> extinguishing fires enterprise first aid requirements worksite evacuation
Environmental requirements	<p>Environmental requirements are to include but are not limited to:</p> <ul style="list-style-type: none"> waste management and clean-up management
Quality requirements	<p>Quality requirements are to include, but are not limited to:</p> <ul style="list-style-type: none"> regulations, including Australian standards internal company quality policies and standards enterprise operations and procedures
Statutory/regulatory authorities	<p>Statutory/regulatory authorities may include:</p> <ul style="list-style-type: none"> federal, state/territory and local authorities administering Acts, regulations and codes of practice
Tooling and equipment	<p>Tooling and equipment may include:</p> <ul style="list-style-type: none"> computers
Materials	<p>Materials may include:</p> <ul style="list-style-type: none"> fabric and cleaning materials
Communications	<p>Communications are to include, but are not limited to:</p> <ul style="list-style-type: none"> verbal and visual instructions and may include worksite specific instructions, written instructions, plans or instructions related to job/task
Information/documents	<p>Sources of information/documents may include:</p>

RANGE STATEMENT

	<ul style="list-style-type: none"> • verbal or written and graphical instructions, catalogues, colour charts, vehicle details, material safety data sheets (MSDS), diagrams or sketches • regulatory/legislative requirements pertaining to trim/fabric materials • organisation work specifications and requirements • instructions issued by authorised enterprise or external persons • Australian standards
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Unit Sector(s)

Unit sector	Vehicle body
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Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Trimming and Upholstery
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AURVTT2006 Select and apply trim and fabric adhesives

Modification History

Release	Comment
Release 1	<p>Replaces AURV231368A Select and apply trim/fabric adhesives</p> <p>Unit code updated to meet policy requirements</p> <p>Minor changes to unit title</p> <p>Reference to OHS legislation replaced with new WHS legislation</p> <p>Licensing statement added to unit descriptor</p>

Unit Descriptor

Unit descriptor	<p>This unit of competency covers the skills and knowledge required to select, prepare and apply trim/fabric adhesives.</p> <p>Licensing, legislative, regulatory or certification requirements may apply to this unit in some jurisdictions. Users are advised to check with the relevant regulatory authority.</p>
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Application of the Unit

Application of the unit	<p>The unit includes identification and confirmation of work requirements, preparation for work, selection, preparation and application of trim adhesives, and completion of work finalisation processes, including clean-up and documentation.</p> <p>This unit may be applied in relation to heavy vehicles, plant and agricultural equipment, recreational craft, mining equipment, marine craft and aircraft.</p> <p>Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	<p>1.1. Work instructions are used to determine job requirements, including method, process and equipment.</p> <p>1.2. Job specifications are read and interpreted.</p> <p>1.3. Workplace health and safety (WHS) requirements, including personal safety needs, are observed throughout the work.</p> <p>1.4. Equipment and tooling are identified and checked for safe and effective operation.</p> <p>1.5. Procedures are determined to minimise task time.</p>
2. Select adhesive	<p>2.1. Information is accessed and interpreted from manufacturer/component supplier specifications.</p> <p>2.2. Adhesives are selected according to material type and adhesive produce/manufacturer/component supplier</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>recommendations.</p> <p>2.3. Activities are carried out according to industry regulations/guidelines, WHS requirements, legislation and enterprise procedures/policies.</p>
3. Prepare surfaces and apply adhesive	<p>3.1. Information is accessed and interpreted from manufacturer/ component supplier specifications.</p> <p>3.2. Adhesive surface preparation and application procedures are carried out in accordance with adhesive product/ manufacturer/component supplier specifications.</p> <p>3.3. Work is completed without causing damage to component or system.</p> <p>3.4. Activities are carried out according to industry regulations/ guidelines, WHS requirements, legislation and enterprise procedures/policies.</p>
4. Clean up work area and maintain equipment	<p>4.1. Material that can be reused is collected and stored.</p> <p>4.2. Waste and scrap is removed following workplace procedure.</p> <p>4.3. Equipment and work area are cleaned and inspected for serviceable condition in accordance with workplace procedures.</p> <p>4.4. Unserviceable equipment is tagged and faults identified in accordance with workplace requirements.</p> <p>4.5. Operator maintenance is completed in accordance with manufacturer/component supplier specifications and worksite procedures.</p> <p>4.6. Tooling and equipment is maintained in accordance with workplace procedures.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- collect, organise and understand information related to work orders, plans and safety procedures for selection, preparation and application of adhesives

REQUIRED SKILLS AND KNOWLEDGE

- technical literacy and communication skills sufficient to interpret and apply common industry terminology, and interpret technical information and specifications
- research and interpretive skills to locate, interpret and apply operational and safety information
- communicate ideas and information to enable confirmation of work requirements and specifications, coordination of work with worksite supervisor, other workers and customers, and the reporting of work outcomes and problems
- plain English literacy and communication skills in relation to dealing with others involved in the work
- questioning and active listening skills, for example when obtaining information for selection, preparation and application of adhesives
- plan and organise activities, including preparation and layout of worksite and obtaining of equipment and material to avoid backtracking or workflow interruptions
- work with others and in a team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- use mathematical ideas and techniques to complete tests and measurements to determine selection, preparation and application of adhesives
- use pre-checking and inspection techniques to anticipate planning and scheduling problems, avoid wastage of time and material
- manipulative and dexterity skills to perform the preparation and application of adhesives
- problem-solving skills for a range of differing procedural issues
- use workplace technology related to selection and application of trim/fabric adhesives, including the use of specialist tooling and equipment, measuring equipment and communication devices and the reporting/documenting of results

Required knowledge

Required knowledge includes:

- WHS cleaning materials, equipment, material and personal safety requirements
- technical information
- product safety requirements
- manufacturer/component supplier/company policies
- adhesive types and their application
- adhesive selection, preparation and application procedures
- work organisation and planning processes
- enterprise quality processes

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of:</p> <ul style="list-style-type: none"> • observing safety procedures and requirements • communicating effectively with others involved in or affected by the work • selecting methods and techniques appropriate to the circumstances • completing preparatory activity in a systematic manner • selecting and applying a range of trim/fabric adhesives • completing workplace records.
Context of, and specific resources for assessment	<ul style="list-style-type: none"> • Application of competence is to be assessed in the workplace or simulated worksite. • Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints. • Assessment is to comply with regulatory requirements, including Australian Standards. • The following resources should be made available: <ul style="list-style-type: none"> • workplace location or simulated workplace • materials relevant to selection and application of trim/fabric adhesives • equipment, hand and power tooling appropriate to selection and application of trim/fabric adhesives • activities covering mandatory task requirements • specifications and work instructions.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed Assessment Guidelines of the Automotive Industry Retail, Service and Repair Training Package. • Assessment methods must confirm consistency and accuracy of performance together with application of underpinning knowledge. • Assessment must be by direct observation of tasks, with questioning on underpinning knowledge and it must also

EVIDENCE GUIDE

	<p>reinforce the integration of key competencies.</p> <ul style="list-style-type: none"> • Assessment may be applied under project-related conditions and require evidence of process. • Assessment must confirm a reasonable inference that competence is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • It is preferable that assessment reflects a process rather than an event and occurs over a period of time to cover varying quality circumstances. Evidence of performance may be provided by customers, team leaders/members or other persons subject to agreed authentication arrangements. • Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.
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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.

Adhesive surface components

Adhesive surface components may include:

- glass components
- mouldings/trim
- mirrors
- weather shields
- body components and panels
- foam, fibreglass and trim fabrics

WHS

WHS requirements are to be in accordance with legislation/regulations/codes of practice and enterprise safety policies and procedures. This may include:

- protective clothing and equipment
- use of tooling and equipment

RANGE STATEMENT	
	<ul style="list-style-type: none"> • workplace environment and safety • handling of material • use of firefighting equipment • enterprise first aid • hazard control and hazardous material and substances
Personal protective equipment	Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices
Safe operating procedures	<p>Safe operating procedures are to include, but are not limited to:</p> <ul style="list-style-type: none"> • operational risk assessment and treatments associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, working in proximity to others and worksite visitors
Emergency procedures	<p>Emergency procedures related to this unit are to include, but are not limited to:</p> <ul style="list-style-type: none"> • emergency shutdown and stopping of equipment • extinguishing fires • enterprise first aid requirements • worksite evacuation
Environmental requirements	<p>Environmental requirements are to include, but are not limited to:</p> <ul style="list-style-type: none"> • waste management, noise, dust and clean-up management
Quality requirements	<p>Quality requirements are to include, but are not limited to:</p> <ul style="list-style-type: none"> • regulations, including Australian standards • internal company quality policies and standards • enterprise operations and procedures
Statutory/regulatory authorities	<p>Statutory/regulatory authorities may include:</p> <ul style="list-style-type: none"> • federal, state/territory and local authorities administering Acts, regulations and codes of practice

RANGE STATEMENT	
Tooling and equipment	<p>Tooling and equipment may include:</p> <ul style="list-style-type: none"> • hand tooling • power/air tooling • cleaning equipment • sealing equipment • cutting equipment
Materials	<p>Materials may include:</p> <ul style="list-style-type: none"> • adhesives, solvents, resins and cleaning materials
Communications	<p>Communications are to include, but are not limited to:</p> <ul style="list-style-type: none"> • verbal and visual instructions and fault reporting and may include worksite specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers
Information/documents	<p>Sources of information/documents may include:</p> <ul style="list-style-type: none"> • verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets (MSDS), diagrams or sketches • safe work procedures related to selection and application of trim/fabric adhesives • regulatory/legislative requirements pertaining to automotive industry, including Australian Design Rules • engineer's design specifications and instructions • organisation work specifications and requirements • instructions issued by authorised enterprise or external persons • Australian standards

Unit Sector(s)

Unit sector	Vehicle body
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Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Trimming and Upholstery
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AVIF3016A Marshal aircraft

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

This unit involves the skills and knowledge required to marshal aircraft during start/shutdown phases, by day and night, and to direct aircraft movements as ground personnel using standard aircraft marshalling signals. Licensing, legislative, regulatory or certification requirements are applicable to this unit.

Application of the Unit

Application of the Unit

Work must be carried out in accordance with workplace procedures and the relevant regulatory requirements of the Civil Aviation Safety Authority (CASA) and other relevant regulatory authorities.

Use for ADF Aviation is to be in accordance with relevant Defence Orders and Instructions and applicable CASA compliance.

Operations are conducted across a variety of operational contexts within the Australian aviation industry.

Work is performed under limited supervision within organisational guidelines. Work may be conducted as part of a team.

This unit of competency is nominally packaged at Certificate III.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

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 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 marshalling | <ul style="list-style-type: none"> 1.1 Arrival/departure information is received and processed in accordance with workplace procedures 1.2 Marshalling requirements for different aircraft types are determined and requirements are clarified where required 1.3 Personal protective equipment is selected and fitted 1.4 Occupational health and safety (OH&S) requirements and recognised safety precautions are applied throughout the operation 1.5 Allocated aircraft parking position is confirmed 1.6 Marshalling, aircraft parking and ancillary support equipment is selected and checked for serviceability 1.7 Relevant documentation is completed in accordance with workplace procedures |
| 2 Establish/disestablish aircraft parking position | <ul style="list-style-type: none"> 2.1 Marshalling, aircraft parking, and ancillary support equipment is positioned and used in accordance with manufacturers instructions and workplace procedures 2.2 Movement is conducted in a safe manner in accordance with workplace procedures 2.3 Environmental factors are monitored to ensure safety is maintained |
| 3 Conduct aircraft marshalling | <ul style="list-style-type: none"> 3.1 Special circumstances/procedures during aircraft marshalling are allowed for 3.2 Standard marshalling signals and/or communications are employed 3.3 Visual contact with the pilot, other aircrew and/or ground staff is maintained |

ELEMENT

PERFORMANCE CRITERIA

- 3.4 Safety distances between aircraft and ground personnel/obstructions are identified and maintained
- 3.5 Emergency actions are conducted in the event of an aircraft fire or other incident, in accordance with workplace procedures
- 3.6 Aircraft is secured/unsecured in accordance with workplace procedures
- 3.7 Allowances are made for wind direction and velocity
- 3.8 Effects of rotor wash and/or engine thrust on personnel and unsecured objects are taken into consideration

Required Skills and Knowledge

REQUIRED KNOWLEDGE AND SKILLS

This describes the essential knowledge and skills and their level required for this unit.

Required knowledge:

- Regulations, legislation, organisational policy and procedures in relation to marshalling aircraft
- Aircraft danger zones
- Day and night marshalling signals
- Effects of wind on aircraft
- Landing/taking-off and starting of aircraft
- Marshalling, ground support and aircraft equipment selection and serviceability
- Procedures in the event of an aircraft fire, accident and emergency
- Aircraft operating restrictions in confined areas
- Security and access requirements
- Workplace procedures applicable to marshalling aircraft
- Manufacturers instructions for equipment used for marshalling aircraft
- Risks that exist when marshalling aircraft and related risk control procedures and precautions
- Problems that may occur when marshalling aircraft and appropriate action that should be taken in each case

Required skills:

- Implement aircraft security and access procedures
- Use standard hand signals
- Identify and correctly use marshalling and ancillary support equipment

REQUIRED KNOWLEDGE AND SKILLS

- Communicate effectively with others when marshalling aircraft
- Read, interpret and follow instructions, regulations, procedures and other information relevant to marshalling aircraft
- Complete documentation related to marshalling aircraft
- Work collaboratively with others when marshalling aircraft
- Adapt appropriately to cultural differences in the workplace, including modes of behaviour and interactions with others
- Promptly report and/or rectify any identified problems that may occur when marshalling aircraft in accordance with regulatory requirements and workplace procedures
- Implement contingency plans for unexpected events that may arise when marshalling aircraft
- Apply precautions and required action to minimise, control or eliminate hazards that may exist when marshalling aircraft
- Monitor and anticipate operational problems and hazards and take appropriate action
- Monitor work activities in terms of planned schedule
- Modify activities dependent on differing workplace contingencies, situations and environments
- Work systematically with required attention to detail without injury to self, others or damage to goods or equipment
- Adapt to differences in equipment and operating environment in accordance with standard operating procedures
- Select and use required personal protective clothing and equipment conforming to industry and OH&S standards
- Implement OH&S procedures and relevant regulations

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills, the range statement and the assessment guidelines for this Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

- The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria of this unit and include demonstration of:
 - applying the underpinning knowledge and skills
 - preparing marshalling including selecting and fitting personal protective equipment
 - conducting movement in a safe manner in accordance with workplace procedures

EVIDENCE GUIDE

- monitoring environmental factors to ensure safety is maintained
 - employing standard marshalling signals and/or communications
 - maintaining visual contact and safety distances
 - conducting emergency actions in the event of an aircraft fire or other incident in accordance with workplace procedures
- Context of and specific resources for assessment**
- Performance is demonstrated consistently over a period of time and in a suitable range of contexts
 - Resources for assessment include:
 - a range of relevant exercises, case studies and/or other simulated practical and knowledge assessment, and/or
 - access to an appropriate range of relevant operational situations in the workplace
 - In both real and simulated environments, access is required to:
 - relevant and appropriate materials and equipment, and
 - applicable documentation including workplace procedures, regulations, codes of practice and operation manuals
- Method of assessment**
- Assessment of this unit must be undertaken by a registered training organisation
 - As a minimum, assessment of knowledge must be conducted through appropriate written/oral tests
 - Practical assessment must occur:
 - through activities in an appropriately simulated environment at the registered training organisation, and/or
 - in an appropriate range of situations in the workplace

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.

Aircraft may include:

- fixed wing
- in any weather conditions
- other airborne vehicles

RANGE STATEMENT

Marshalling operations may include:

- day and night
- variable weather conditions
- international, domestic and regional airports
- helidecks

Marshalling context may include:

- start-up
- shutdown
- rotor engagement
- taxiing
- hover
- hover taxiing
- allocating and prioritising aircraft parking
- parking

Arrival and departure information may include:

- formalised tasking information
- informal tasking information for action in accordance with localised procedures
- informal information received by other means such as hand signals, phone, facsimile, email, text message or radio communications regarding aircraft safety (e.g. hot brakes, fuel leak, security)

Marshalling requirements for different aircraft types may include:

- access
- security

Personal protective equipment may include:

- eye goggles
- head protection
- hearing protection
- high visibility clothing
- protective overalls
- protective boots
- respiratory protection equipment

Marshalling equipment may include

- wands
- paddles
- flags
- torches

Aircraft parking equipment may include:

- covers and intake inserts (bungs)
- earthing leads
- flags
- magnetic pins
- mechanical locking devices
- tie-down devices
- wheel chocks

RANGE STATEMENT

Ancillary support equipment may include:

- access/egress equipment
- external aircraft power facilities
- fire extinguisher
- first aid kit
- parking markers and barriers

Dependent on the type of organisation concerned and the local terminology used, workplace procedures may include:

- Defence Instructions
- organisational policies
- company procedures
- enterprise procedures
- organisational procedures
- established procedures
- standard operating procedures
- written and verbal instructions

Special circumstances/procedures may include:

- negative rotation
- power sources
- safety requirements e.g. fire bottle attendants
- aircraft with no prop or rotor brake
- installation of locking, protection or security devices
- undercarriage lock pins
- safety pin requirements for aircraft carrying ordnance

Emergency actions may include:

- basic fire fighting
- basic first aid
- crowd control
- aircraft evacuation procedures
- notifying emergency services

Standard marshalling signals include:

- standard hand signals
- International Civil Aviation Organization (ICAO) signals

Information/documents may include:

- relevant sections of Civil Aviation Safety Regulations and Civil Aviation Orders
- in Defence context, relevant Defence Orders and Instructions
- operations manuals
- workplace procedures and instructions and job specification
- induction and training materials

Applicable regulations and legislation may include:

- relevant Civil Aviation Safety Regulations and Civil Aviation Orders
- in Defence context, relevant Defence Orders and Instructions
- relevant state/territory OH&S legislation

RANGE STATEMENT

Performance includes tolerances specified in either of:

- relevant state/territory environmental protection legislation
- relevant Australian Standards
- relevant licence and aircraft requirements of the Civil Aviation Safety Authority such as:
 - Day VFR syllabus
 - Manual of Standards
- relevant Defence documentation such as:
 - Defence Orders and Instructions
 - approved curricula and training documentation

Unit Sector(s)

Not applicable.

Competency field

Competency Field F - Safety Management

DEFEO101D Work safely with explosive ordnance

Modification History

Release	TP version	Comments
2	DEF12 V2	Layout adjusted.
1	DEF12 V1	First release.

Unit Descriptor

This unit covers the competency required to achieve a safe work environment when working with explosive ordnance.

Application of the Unit

This competency normally applies in any installation or organisation involved in the storage, distribution, maintenance and use of explosive ordnance; this includes research and development establishments, and proof and experimental establishments.

Explosive ordnance being all munitions containing explosives, nuclear fission or fusion materials, and biological and chemical agents.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Access and apply safety procedures	1.1 <i>Safety procedures and instructions</i> are accessed and clarified 1.2 All work is conducted within the requirements of <i>organisational</i> permit-to-work and/or tag out procedures 1.3 Breaches in site safety are identified and acted on or reported in accordance with organisational reporting procedures 1.4 Load handling and shifting procedures are selected in accordance with identified requirements for particular goods 1.5 Handling equipment is checked for conformity with workplace requirements and manufacturer's guidelines 1.6 Where relevant, suitable signage is checked for compliance with workplace procedures
2. Apply personal safety measures	2.1 <i>Personal protective measures</i> are followed in accordance with organisational policy and procedures 2.2 Safety of immediate working area and equipment is established and maintained in accordance with organisational policy, procedures and directives 2.3 Relevant authorisation is obtained before specialised and hazardous work is carried out in accordance with organisational procedures and directives
3. Apply dangerous goods and hazardous substances requirements	3.1 Individual responsibilities regarding <i>dangerous goods and hazardous substances</i> are recognised and applied 3.2 Legislative requirements for hazardous substances and/or dangerous goods are understood and are used to plan work activities 3.3 Dangerous goods and hazardous substances labels and characteristics are identified and recognised, and relevant action/criteria is applied 3.4 Confirmation is sought from relevant personnel where dangerous goods or hazardous materials do

ELEMENT	PERFORMANCE CRITERIA
4. Apply net explosive quantity and compatibility	<p>not appear to be appropriately marked</p> <p>3.5 Dangerous goods and hazardous substances are stored in accordance with the relevant compatibility, separation constraints and security requirements</p> <p>3.6 Dangerous goods and hazardous substances are handled and moved in accordance with legislative requirements and organisational procedures</p> <p>4.1 Documentation and licensing limitations are identified and/or acquired in accordance with organisational policy and procedures</p> <p>4.2 <i>Net explosive quantity</i> is applied in accordance with statutory requirements and organisational policy and procedures</p> <p>4.3 <i>Compatibility</i> is applied in accordance with statutory requirements and organisational policy and procedures</p>
5. Identify and report incidents	<p>5.1 Incidents and injuries are identified, recorded and <i>reported</i> in accordance with organisational procedures</p> <p>5.2 Participation in incident investigations is conducted in accordance with the responsibilities and protection under legislation</p>

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- access, read, interpret and apply information on safety
- apply area safety procedures
- apply compatibility
- apply net explosive quantity
- apply safe manual handling procedures
- comply with hazardous materials requirements
- encourage other team members
- follow instructions/directives and report information
- identify and report hazards and incidents
- identify, select and use personal protection measures
- read to a level required to interpret job instructions, workplace forms and reports
- use a variety of verbal and non-verbal communication techniques

- write at the level required to complete workplace documentation and reports

Required Knowledge

- application of compatibility
- application of net explosive quantity
- composition of teams and roles and responsibilities of team members
- hazard and incident identification and reporting techniques
- hazardous materials requirements
- manual handling procedures
- organisational safety policies and structures
- organisational safety information sources
- personal protection measures
- safety and advisory signs
- team work
- techniques for supporting others
- verbal and non-verbal communication techniques
- written communication to a level required to complete workplace documentation and reports

Evidence Guide

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.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessment must confirm the ability to comply with organisational safety requirements, and appropriate legislative and regulatory requirements.

Assessment must also confirm the ability to work safely within an explosive ordnance environment and to:

- identify, select and use personal protective measures
- apply safe manual handling practices
- apply net explosive quantity
- apply compatibility
- identify and report hazards and incidents
- participate in incident investigations

Consistency in performance

Competency should be demonstrated over time and observed in a range of actual or simulated explosive ordnance contexts.

Context of and specific resources for assessment

Context of assessment

Competency should be assessed in the workplace or in a simulated work environment and in accordance with all relevant legislation and organisational requirements.

Evidence should be gathered through observation of the practical component and targeted questioning to assess required knowledge.

Specific resources for assessment

Access is required to:

- facilities and resources used in the storage, distribution or maintenance of explosive ordnance.

Method of assessment

In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook.

Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment.

Assessment may occur in an operational environment or in an industry-approved simulated work environment. Forms of assessment that are typically used include:

- direct observation
- interviewing the candidate
- journals and workplace documentation
- third party reports from supervisors
- written or oral questions

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.

Explosive ordnance may include:

- All munitions containing explosives, nuclear fission or fusion materials and biological and chemical agents, including:
- all mines, torpedoes and depth charges
- artillery, mortar, rocket and small arms ammunition
- bombs and warheads

Safety procedures and instructions may include:

Organisation may include:

Personal protective measures may include:

Dangerous goods and hazardous substances may include:

Net explosive quantity includes:

Compatibility is:

Reports may include:

- cartridge and propellant actuated devices
- clandestine and other improvised explosive devices
- clusters and dispensers
- demolition charges
- electro explosive devices
- guided and ballistic missiles
- pyrotechnics
- all similar or related items or components explosive in nature
- explosive ordnance governance regulations, policy and procedures
- organisational instructions
- defence organisation
- enterprises that work with explosive ordnance
- other government departments or instrumentalities that work with explosive ordnance
- adherence to all work health and safety (WHS) regulations, policy and procedures
- organisational instructions
- personal protective equipment
- any item that is identified by the UN Classification System for Dangerous Goods
- explosive capacity calculated in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance
- applied in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance and other hazardous materials
- approved forms
- verbal
- written

Unit Sector(s)

Not applicable.

DEFEO301D Package ammunition

Modification History

Release	TP version	Comments
2	DEF12 V2	Layout adjusted.
1	DEF12 V1	First release.

Unit Descriptor

This unit covers the competency required to package ammunition, explosive ordnance and explosive components for transportation and storage.

Application of the Unit

This competency normally applies to the individual who is required to prepare, package and finalise documentation for ammunition, explosive ordnance and explosive components for the purpose of transportation and storage, where packaging includes painting, stencilling, marking, sealing strapping, vacuum evacuation and labelling.

The unit requires the individual to calculate net explosive quantity, apply compatibility constraints, mark the packaging with internationally recognised coding and maintain a range of documentation.

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 Performance Criteria describe the required performance

essential outcomes of a Unit of Competency.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for packaging	<p>1.1 <i>Packaging requirements</i> are identified from work requests/instructions and confirmed with relevant personnel</p> <p>1.2 Work health and safety (WHS) requirements, including those contained in <i>organisational</i> procedures, are applied throughout the operation</p> <p>1.3 <i>Technical references</i>, tools, equipment, consumables and packaging components are identified, acquired and prepared in accordance with organisational procedures</p> <p>1.4 <i>Net explosive quantities</i> and <i>compatibility</i> are identified, calculated, analysed and applied throughout the operation</p> <p>1.5 <i>Environmental conditions</i> are monitored and maintained in accordance with organisational policy</p>
2. Pack ammunition/explosive ordnance	<p>2.1 Ammunition/explosive ordnance or explosive components are identified and <i>prepared</i> for packaging in accordance with organisational policy and procedures</p> <p>2.2 Ammunition/explosive ordnance or explosive components are packaged in accordance with technical instructions, technical drawings and organisational procedures</p> <p>2.3 Emergency and contingency procedures are applied in accordance with organisational policy</p> <p>2.4 Packaging is prepared and marked in accordance with statutory and organisational requirements</p> <p>2.5 Unit load is assembled and prepared in accordance with shipping/storing requirements and organisational procedures</p> <p>2.6 Relevant <i>calculations</i> are carried out and recorded</p>
3. Finalise packaging procedures	<p>3.1 Equipment/tools are maintained in accordance with organisational policy and procedures</p>

ELEMENT**PERFORMANCE CRITERIA**

3.2 *Documentation and records* are maintained in accordance with statutory, organisational and workshop requirements

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- apply colour coding, markings, stencilling and labels
- apply compatibility constraints
- apply environmental constraints
- apply moisture absorption procedures
- apply relevant WHS requirements
- apply operational safety
- apply sealing procedures
- calculate and maintain net explosive quantity
- calculate weight, volume and dimensions
- identify ammunition/explosive ordnance and packaging materials
- maintain documentation
- package ammunition/explosive ordnance
- read, access, interpret and apply technical instructions and drawings related to packaging of ammunition/explosive ordnance
- purge ammunition and package
- use relevant tools and equipment

Required Knowledge

- ammunition/explosive ordnance to be packaged
- appropriate ammunition/explosive ordnance packaging
- colour coding, markings, stencilling and labelling requirements
- compatibility constraints
- documentation requirements
- effects of environmental conditions
- heat and/or vacuum sealing procedures
- moisture absorption procedures
- net explosive quantity calculations
- operation and limitations of packaging tools and equipment
- operational safety
- packaging procedures

- purging procedures
- relevant WHS requirements
- weight volume and dimension calculations
- work condition class

Evidence Guide

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.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessment must confirm the ability to:

- adhere to relevant WHS requirements and operational safety
- identify and select appropriate packaging materials and components
- package ammunition
- mark and label packaged ammunition/explosive ordnance
- maintain documentation

Consistency in performance

Competency should be demonstrated over time and in a range of actual or simulated explosive ordnance contexts.

Context of and specific resources for assessment

Context of assessment

Competency should be assessed in the workplace or under conditions which accurately simulate a realistic workplace in accordance with all relevant legislation and organisational requirements.

Evidence should be gathered through observation of the practical component and targeted questioning to assess required knowledge.

Specific resources for assessment

Access is required to:

- facilities and resources used in the packaging, storage, distribution and maintenance of explosive ordnance, including a licensed explosive site

Method of assessment

This unit may be assessed with the following unit:

- DEFEO101D Work safely with explosive ordnance.

In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook.

Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment.

Assessment may occur in an operational environment or in an industry-approved simulated work environment.

Forms of assessment that are typically used include:

- direct observation
- interviewing the candidate
- journals and workplace documentation
- third party reports from supervisors
- written or oral questions

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.

<i>Packaging requirements</i> may include:	<ul style="list-style-type: none"> • Labelling • Marking • Painting • Sealing • Stencilling • Strapping • Vacuum evacuation
<i>Organisation</i> may include:	<ul style="list-style-type: none"> • Defence organisation • Enterprises that work with explosive ordnance • Other government departments or instrumentalities that work with explosive ordnance
<i>Technical references</i> may include:	<ul style="list-style-type: none"> • Orders and instructions • Pamphlets • Publications • Technical drawings
<i>Net explosive quantities</i> include:	<ul style="list-style-type: none"> • Explosive capacity calculated in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance

<i>Compatibility</i> is:	<ul style="list-style-type: none"> Assessed in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance and other hazardous materials
<i>Environmental conditions</i> may include:	<ul style="list-style-type: none"> Humidity Pressure Temperature
<i>Preparation</i> may include:	<ul style="list-style-type: none"> Confirmation of amendment status of technical references and publications Inspection of packaging to confirm condition status Inspection of the ammunition/explosive ordnance or associated components to confirm condition status Pre-positioning of consumables and tools Visual confirmation that the ammunition/explosive ordnance or associated components selected for the operation are the correct items
<i>Calculations</i> may include:	<ul style="list-style-type: none"> Compatibility Net explosive quantities Packaging dimensions Packaging volume Packaging weight
<i>Documentation and records</i> may include:	<ul style="list-style-type: none"> Data cards Placarding Receipt and issue records Shipping name Timesheets UN number Work records

Unit Sector(s)

Not applicable.

DEFEO302D Unpackage ammunition

Modification History

Release	TP version	Comments
2	DEF12 V2	Layout adjusted.
1	DEF12 V1	First release.

Unit Descriptor

This unit covers the competency required to unpackage ammunition/explosive ordnance and explosive components prior to inspection or maintenance.

Application of the Unit

This competency normally applies to the individual who is required to prepare for and unpack ammunition/explosive ordnance and explosive components prior to inspection or maintenance.

The unit requires the individual to calculate net explosive quantity, apply compatibility constraints, inspect the packaging and maintain a range of documentation.

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

Performance Criteria describe the required performance needed to demonstrate achievement of the element.

Where ***bold italicised*** text is used, further information is

of Competency.

detailed in the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for unpackaging	<p>1.1 <i>Unpackaging requirements</i> are identified from work requests/instructions and are confirmed with relevant personnel</p> <p>1.2 Work health and safety (WHS) requirements, including those contained in <i>organisational</i> procedures, are applied throughout the operation</p> <p>1.3 <i>Technical references</i>, tools and equipment are identified, acquired and prepared in accordance with organisational procedures</p> <p>1.4 <i>Net explosive quantities</i> and <i>compatibility</i> are identified, calculated, analysed and applied throughout the operation</p> <p>1.5 Emergency and contingency procedures are applied in accordance with organisational policy</p> <p>1.6 <i>Environmental conditions</i> are monitored and maintained in accordance with organisational policy</p>
2. Unpack ammunition/explosive ordnance	<p>2.1 Ammunition/explosive ordnance or explosive components are prepared for unpackaging in accordance with organisational policy and procedures</p> <p>2.2 Ammunition/explosive ordnance or explosive components are unpackaged in accordance with technical instructions, technical drawings and organisational procedures</p> <p>2.3 Packaging material is stored or disposed of in accordance with statutory and organisational policy</p> <p>2.4 Relevant <i>calculations</i> are carried out and recorded</p>
3. Finalise unpackaging procedures	<p>3.1 Equipment/tools are maintained in accordance with organisational policy and procedures</p> <p>3.2 <i>Documentation and records</i> are maintained in accordance with statutory, organisational and workshop requirements</p>

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- apply anti static procedures
- apply compatibility constraints
- apply environmental constraints
- apply operational safety
- apply relevant WHS requirements
- calculate and maintain net explosive quantity
- identify ammunition/explosive ordnance and packaging materials
- identify colour codings, markings and labels
- maintain documentation
- read, access, interpret and apply technical instructions and drawings related to packaging of ammunition/explosive ordnance
- use unpackaging tools and equipment
- vent containers

Required Knowledge

- ammunition/explosive ordnance to be unpackaged
- anti static procedures
- appropriate ammunition/explosive ordnance packaging
- colour coding, markings
- compatibility constraints
- documentation requirements
- effects of environmental conditions
- net explosive quantity calculations
- operational safety
- operations and limitations of unpackaging tools and equipment
- relevant WHS requirements
- work condition class
- venting procedures

Evidence Guide

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.

Critical aspects for assessment and evidence

Assessment must confirm the ability to:

- adhere to relevant WHS requirements and

required to demonstrate competency in this unit

- operational safety
- identify and select appropriate unpackaging tools and equipment
- maintain documentation.

Consistency in performance

Competency should be demonstrated over time and in a range of actual or simulated explosive ordnance contexts.

Context of and specific resources for assessment**Context of assessment**

Competency should be assessed in the workplace or under conditions which accurately simulate a realistic workplace in accordance with all relevant legislation and organisational requirements.

Evidence should be gathered through observation of the practical component and targeted questioning to assess required knowledge.

Specific resources for assessment

Access is required to:

- facilities and resources used in the packaging, storage, distribution and maintenance of explosive ordnance, including a licensed explosive site.

Method of assessment

This unit may be assessed with the following unit:

- DEFEO101D Work safely with explosive ordnance.

In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook.

Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment.

Assessment may occur in an operational environment or in an industry-approved simulated work environment. Forms of assessment that are typically used include:

- direct observation
- interviewing the candidate
- journals and workplace documentation
- third party reports from supervisors
- written or oral questions

Range Statement

<p>The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. <i>Bold italicised</i> wording in the Performance Criteria is detailed below.</p>	
<p><i>Unpackaging requirements of ammunition or explosives</i> may require:</p>	<ul style="list-style-type: none"> • Inspection of the ammunition/explosive ordnance container prior to unpackaging • Application of anti-static probes • Venting of the container • Disposal of explosively contaminated materials or consumables
<p><i>Organisation</i> may include:</p>	<ul style="list-style-type: none"> • Defence organisation • Other government departments or instrumentalities that work with explosive ordnance • Enterprises that work with explosive ordnance
<p><i>Technical references</i> may include:</p>	<ul style="list-style-type: none"> • Technical drawings • Pamphlets • Publications • Orders and instructions
<p><i>Net explosive quantities</i> include:</p>	<ul style="list-style-type: none"> • Explosive capacity calculated in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance
<p><i>Compatibility</i> is:</p>	<ul style="list-style-type: none"> • Assessed in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance and other hazardous materials
<p><i>Environmental conditions</i> may include:</p>	<ul style="list-style-type: none"> • Humidity • Pressure • Temperature
<p><i>Calculations</i> may include:</p>	<ul style="list-style-type: none"> • Net explosive quantities • Compatibility
<p><i>Documentation and records</i> may include:</p>	<ul style="list-style-type: none"> • Data cards • Receipt and issue records • Time sheets • UN numbers • Work records

Unit Sector(s)

Not applicable.

DEFEO501D Conduct explosive ordnance inspection

Modification History

Release	TP version	Comments
2	DEF12 V2	Layout adjusted.
1	DEF12 V1	First release.

Unit Descriptor

This unit covers the competency required to conduct an inspection on all types of explosive ordnance in order to assess its condition and to process further action.

Application of the Unit

This competency normally applies to the individual who is required to conduct an inspection on all types of explosive ordnance in order to assess its condition and to process the explosive ordnance for further action.

The inspection of the explosive ordnance is carried out in a logical sequence while adhering to all relevant work health and safety (WHS) requirements. How the explosive ordnance is processed is subject to the outcomes of the inspection. In the case of defective or damaged explosive ordnance it may be retained and returned to the manufacturer, maintained or disposed of, or restrictions may be placed on its use.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for inspection	<p>1.1 Requirement for <i>explosive ordnance inspection</i> is identified from work requests/instructions and confirmed</p> <p>1.2 WHS requirements, including those contained in <i>organisational</i> procedures, are applied throughout the operation</p> <p>1.3 <i>Technical references</i>, tools and equipment required for the inspection are identified, acquired and prepared in accordance with organisation procedures</p> <p>1.4 Explosive ordnance is acquired, identified and accounted for, moved or pre-positioned in preparation for inspection</p> <p>1.5 <i>Net explosive quantities</i> and <i>compatibility</i> are identified, calculated, assessed and applied throughout the operation</p>
2. Inspect explosive ordnance	<p>2.1 Explosive ordnance is <i>inspected</i> in a logical set sequence to ensure that <i>defects or damage</i> are not overlooked in accordance with organisation policy and procedures and technical specifications</p> <p>2.2 Damage or other defects are identified and recorded in accordance with organisation procedures</p>
3. Carry out post inspection procedures	<p>3.1 Explosive ordnance is <i>processed</i> in accordance with organisation procedures</p> <p>3.2 <i>Documentation and records</i> are maintained in accordance with statutory, organisation and workshop requirements</p>

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- apply compatibility constraints
- apply safety policies and structures
- apply WHS requirements
- calculate net explosive quantity
- communicate orally and in writing
- maintain documentation
- read, access, interpret and apply technical instructions and drawings related to explosive ordnance inspections
- use relevant tools and equipment

Required Knowledge

- assessment of compatibility
- calculation of net explosive quantity
- characteristics and limitations of explosive ordnance to be inspected
- inspection procedures
- organisational documentation requirements
- organisational WH&S requirements
- organisational safety policies and structures

Evidence Guide

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessment must confirm the ability to comply with:

- organisational safety requirements
- appropriate legislative and regulatory requirements.

Assessment must also confirm the ability to work safely within an explosive ordnance environment and to:

- calculate and apply net explosive quantity
- assess and apply compatibility
- process explosive ordnance
- maintain documentation

Consistency in performance

Competency should be demonstrated in a range of actual or simulated explosive ordnance contexts.

Context of and specific resources for assessment

Context of assessment

Competency should be assessed in the workplace or in a simulated work environment, in accordance with all relevant legislation and organisation requirements.

Specific resources for assessment

Access is required to:

- facilities and resources used in the storage, distribution or maintenance of explosive ordnance, including a licensed explosive site

Method of assessment

This unit may be assessed with the following unit:

- DEFEO101D Work safely with explosive ordnance.

In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook.

Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment.

Assessment may occur in an operational environment or in an industry-approved simulated work environment. Forms of assessment that are typically used include:

- direct observation
- interviewing the candidate
- journals and workplace documentation
- third party reports from supervisors
- written or oral questions

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.

Explosive ordnance inspections may be conducted:

- As part of a work program
- On direction
- On receipt
- Prior to maintenance
- Prior to or post any activity
- And may include inspection to confirm free from

	explosives, the use of special measuring devices, gauges and locally patented tools
Organisation may include:	<ul style="list-style-type: none"> • Defence organisation • Enterprises that work with explosive ordnance • Other government departments or instrumentalities that work with explosive ordnance
Technical references may include:	<ul style="list-style-type: none"> • Technical drawings • Technical reference pamphlets • Orders and instructions • Other publications
Net explosive quantities include:	<ul style="list-style-type: none"> • Explosive capacity calculated in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance
Compatibility is:	<ul style="list-style-type: none"> • Assessed in a wide range of activities related to the storage, distribution and maintenance of explosive ordnance and other hazardous materials
Inspection may result in explosive ordnance being:	<ul style="list-style-type: none"> • Passed for use • Recommended for sentencing • Rejected
Explosive ordnance defects or damage may include:	<ul style="list-style-type: none"> • Non-compliance with technical specifications • Corrosion • Surface damage
Processing may include:	<ul style="list-style-type: none"> • Disposal, including: <ul style="list-style-type: none"> • jettisoning • ditching • destruction • restrictions on use • Retention for return or maintenance
Documentation and records may include:	<ul style="list-style-type: none"> • Receipt and issue records • Timesheets • Work records

Unit Sector(s)

Not applicable.

DEFEO718C Maintain cartridge operated fire extinguisher systems

Modification History

Release	TP version	Comments
2	DEF12 V2	Layout adjusted.
1	DEF12 V1	First release.

Unit Descriptor

This unit covers the competency required to maintain cartridge operated fire extinguishers which contain explosive ordnance.

Application of the Unit

This competency normally applies to the individual who is required to conduct maintenance on cartridge operated fire extinguishers which contain explosive ordnance.

It includes the attachment of safety devices to the fire extinguishers while they are being maintained and the testing of the explosive ordnance cartridge in the fire extinguisher.

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

Performance Criteria describe the required performance needed to demonstrate achievement of the element.

of Competency.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for the maintenance of fire extinguishers	<p>1.1 Requirement for <i>cartridge operated fire extinguishers</i> maintenance is identified from work requests/instructions and is confirmed</p> <p>1.2 Work health and safety (WHS) requirements, including those contained in organisational procedures, are applied throughout the operation</p> <p>1.3 <i>Technical references</i>, tools and equipment required for the maintenance are identified, acquired and prepared in accordance with organisational procedures</p> <p>1.4 Safety devices appropriate to the fire extinguisher are installed prior to and on completion of, any maintenance in accordance with organisational procedures</p>
2. Maintain fire extinguishers	<p>2.1 Fire extinguishers are inspected in accordance with organisational policy and procedures</p> <p>2.2 <i>Relevant maintenance</i> is conducted in accordance with organisational procedures, technical specifications and drawings</p> <p>2.3 Emergency and contingency procedures are applied in accordance with organisational policy</p> <p>2.4 Relevant <i>tests</i> are conducted and recorded in accordance with organisational procedures, technical specifications and drawings</p>
3. Finalise the maintenance operation	<p>3.1 Fire extinguishers are processed in accordance with the requirements specified in the work request</p> <p>3.2 Equipment/tools are maintained in accordance with organisational policy and procedures</p> <p>3.3 Housekeeping procedures are conducted in accordance with workshop requirements</p> <p>3.4 <i>Documentation and records</i> are maintained in accordance with statutory, <i>organisation</i> and workshop requirements</p>

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- apply environmental constraints
- apply operational safety
- apply relevant WHS requirements
- communicate orally and in writing
- conduct tests
- identify and select appropriate tools and equipment
- identify appropriate cartridge operated fire extinguishers
- maintain documentation
- use tools and equipment

Required Knowledge

- colour coding, marking and labels
- documentation requirements
- effects of environmental conditions
- maintenance procedures
- operational safety
- operations, characteristics and limitations of cartridge operated fire extinguishers to be maintained
- operations, characteristics and limitations of tools and equipment used in maintenance
- relevant WHS requirements
- testing procedures

Evidence Guide

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.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessment must confirm the ability to comply with:

- organisational safety requirements
- appropriate legislative and regulatory requirements while maintaining fire extinguishers

Assessment must also confirm the ability to:

- work safely within an explosive ordnance environment
- calculate and apply net explosive quantity
- assess and apply compatibility
- conduct relevant tests
- maintain documentation

Consistency in performance

Competency should be demonstrated in a range of actual or simulated explosive ordnance contexts.

Context of and specific resources for assessment

Context of assessment

Competency should be assessed in the workplace or in a simulated workplace environment, in accordance with all relevant legislation and organisational requirements.

Specific resources for assessment

Access is required to:

- facilities and resources used in the storage, distribution or maintenance of explosive ordnance, including a licensed explosive site

Method of assessment

This unit may be assessed with the following unit:

- DEFEO101D Work safely with explosive ordnance.

In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook.

Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment.

Assessment may occur in an operational environment or in an industry-approved simulated work environment.

Forms of assessment that are typically used include:

- direct observation
- interviewing the candidate
- journals and workplace documentation
- third party reports from supervisors
- written or oral questions

Range Statement

<p>The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. <i>Bold italicised</i> wording in the Performance Criteria is detailed below.</p>	
<p><i>Cartridge operated fire extinguishers</i> may include:</p>	<ul style="list-style-type: none"> • All items currently on the Australian Defence Force in-service Cartridge operated fire extinguisher inventory • Cartridge operated fire extinguishers in aircraft and armoured vehicles
<p><i>Technical references</i> may include:</p>	<ul style="list-style-type: none"> • Orders and instructions • Technical drawings • Technical reference pamphlets • Other publications
<p><i>Relevant maintenance</i> may include:</p>	<ul style="list-style-type: none"> • Arming and de-arming • Cartridge fitment • Cleaning • Components change out • Painting
<p><i>Tests</i> may include:</p>	<ul style="list-style-type: none"> • Continuity tests • Gauging • Measuring
<p><i>Processing</i> may include:</p>	<ul style="list-style-type: none"> • Forwarding components for disposal, storage or testing and may include some additional preparation such as packaging
<p><i>Documentation and records</i> may include:</p>	<ul style="list-style-type: none"> • Receipt and issue records • Timesheets • Work records
<p><i>Organisation</i> may include:</p>	<ul style="list-style-type: none"> • Defence organisation • Enterprises that work with explosive ordnance • Other government departments or instrumentalities that work with explosive ordnance

Unit Sector(s)

Not applicable.

LMTTF2008A Use adhesives

Modification History

Not applicable.

Unit Descriptor

Unit descriptor This unit covers the skills and knowledge required to select and safely use adhesives on canvas and sail products.

Application of the Unit

Application of the Unit This unit applies to the bonding of materials with adhesives on canvas and sail products. Work may be conducted in a variety of environments, such as:

- operational indoor workplaces
- operational outdoor workplaces
- hazardous or exposed conditions

Work may be conducted in small to large scale enterprises and may involve individual and team activities. Work is performed within defined procedures under direct supervision.

The application of this unit is according to OHS practices of the enterprise and workplace practices, which may include:

- requirements prescribed by legislation, awards, agreements and conditions of employment
- standard operating procedures
- work instructions
- oral, written and visual communication
- quality practices, including responsibility for maintenance of own work quality and contribution to quality improvement of team or section output
- housekeeping
- tasks related to environmental protection, waste disposal, pollution control and recycling

This unit requires the application of skills associated with planning and organising for the safe and effective use of adhesives and textile fabrication technology. This unit also requires communication skills

to read and apply workplace information and complete work records. Self management skills are applied to ensure workplace and quality standards are achieved.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

Employability Skills Information

Employability Skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare work area	1.1 Safe working environment is established 1.2 Suitable electrical power outlets are identified, if required 1.3 Work is sequenced to maximise safety and productivity 1.4 Workplace procedures and instructions are read and interpreted
2 Select, use and store tools	2.1 Appropriate hand tools, power tools and electrical equipment are obtained for the work to be performed 2.2 Tools are examined for damage, missing components or other defects (including frayed power cords where applicable) 2.3 Extension power cables are checked for knots and insulation damage 2.4 Electrical tools are connected safely to power supply 2.5 Safety equipment is used during tool operation in accordance with OHS practices

ELEMENT	PERFORMANCE CRITERIA
3 Select adhesives and prepare for their use	2.6 Tasks are performed using tools in accordance with safe working practices 2.7 Tools are located in a safe position when not in use 2.8 Tools and extension cords are cleaned and stored in accordance with industry and enterprise safe working practices 3.1 Nature of materials to be joined is ascertained 3.2 Specified adhesives are obtained 3.3 Appropriate tools and materials are selected for preparation of work piece surfaces and application of adhesive 3.4 Adhesive manufacturer's OHS requirements are checked and prescribed precautions taken before adhesives are used 3.5 Adhesive is prepared to manufacturer's instructions
4 Apply adhesive and bond materials	4.1 Work piece surfaces are prepared for application of adhesive 4.2 Work piece surfaces to be bonded are anchored or otherwise stabilised 4.3 Adhesive is applied in accordance with recommended practice and surfaces are joined 4.4 Joins are allowed to cure for specified time 4.5 Where appropriate, heat to assist in curing the joins is applied to the work piece in accordance with OHS practices 4.6 Knowledge of using adhesives are applied to perform required tasks
5 Inspect and rectify	5.1 Work piece is removed and joins are informally inspected and tested for strength 5.2 Results of informal inspection are verified by supervisor and appropriate action is taken regarding rework or rectification, if necessary
6 Clean up and documentation	6.1 Product is prepared for inspection 6.2 Work area is cleaned and tools and equipment are cleaned and stored in accordance with OHS practices 6.3 Remaining adhesive is safely disposed of or stored in a safe, secure location 6.4 Work records are completed in accordance with workplace requirements

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Demonstrates knowledge of:

- health, fire and explosion hazards associated with the use of volatile or toxic adhesives and solvents, and specific OHS requirements regarding their use, safe handling and storage
- the range of canvas products in common use
- bonding principles and techniques
- commonly used glues, adhesives and solvents
- curing characteristics of commonly used adhesives and the effects of atmospheric conditions
- quality standards for bonding processes
- safety and environmental requirements of relevant industry and enterprise procedures
- general housekeeping policies and procedures
- OHS practices, including hazard identification and control measures
- quality practices
- workplace practices
- recording and reporting practices

Demonstrates skills to:

- locate and interpret technical information about canvas products, adhesives and equipment used in bonding processes
- use relevant hand and power tools
- use relevant chemicals and cleaning agents and dispose of waste products
- maintain work area
- read, interpret and follow information on work specifications, standard operating procedures and work instructions and other reference material
- maintain accurate records
- communicate within the workplace
- sequence operations
- meet specifications
- clarify and check task-related information
- carry out work according to OHS practices

Evidence Guide

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 the Training Package.

Critical aspects of evidence to be considered

Demonstrates skills and knowledge to:

- comply with all relevant safety requirements including safe use of adhesives, solvents, hand tools and electrical equipment
- follow work orders
- understand equipment and materials instructions applicable to the use of adhesives
- prepare product to be bonded and set up adhesive application equipment
- perform bonding process
- perform normal operator maintenance of work area to enable work to be conducted safely and efficiently
- document and communicate work related information including reporting of faults and other problems

Consistently applies skills and knowledge when:

- organising work
- completing tasks
- identifying improvements
- using workplace practices
- using OHS practices
- recording and reporting accidents and incidents
- assessing operational readiness of equipment used and work processes
- recognising and adapting to cultural differences in the workplace, including modes of behaviour and interactions
- completing work systematically with attention to detail without damage to goods and equipment

Context and specific resources for assessment

Assessment may occur on the job or in an appropriately simulated environment and requires access to work areas, materials and equipment, and to information on workplace practices and OHS practices.

Guidance information for assessment

This unit may be assessed independently or in combination with other relevant units.

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. Add any 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.

Legislative/regulatory requirements All work must comply with relevant Federal and State or Territory legislative or regulatory requirements.

Power tools may include

- spray guns
- portable ventilation fans
- hot air dryers
- heat lamps

OHS practices OHS practices must include hazard identification and control, risk assessment and implementation of risk reduction measures specific to the tasks described by this unit, and may include:

- manual handling techniques
- standard operating procedures
- personal protective equipment
- safe materials handling
- taking of rest breaks
- ergonomic arrangement of workplaces
- following marked walkways
- safe storage of equipment
- housekeeping
- reporting accidents and incidents
- other OHS practices relevant to the job and enterprise

Unit Sector(s)

Sector Textile Fabrication

MEA101 Interpret work health and safety practices in aviation maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency covers the skills and knowledge required to comply with work health and safety (WHS) regulations and work safely in aircraft maintenance areas. It requires application of WHS practices relevant to aviation maintenance workplaces in order to ensure own safety and that of others in the workplace.

Workplaces include the flight line or tarmac, hangars and workshops. Maintenance activities include all scheduled and unscheduled maintenance on fixed or rotary wing aircraft and on the components thereof. Work may be performed individually or as part of a team.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|------------------------|---|
| 1. Interpret safe work | 1.1 Relevant regulatory and enterprise policies and procedures that identify the requirements for conduct |
|------------------------|---|

practices		of safe work are interpreted and understood
	1.2	Workplace housekeeping measures are identified in accordance with standard enterprise procedures
	1.3	Use of personal protective equipment (PPE) is identified and understood and maintenance measures are interpreted and understood according to regulatory and enterprise procedures
	1.4	Safety signs and symbols are interpreted and understood, and their directions observed in accordance with enterprise and safety requirements
2.	Interpret reporting procedures for workplace hazards	2.1 Workplace hazards are correctly identified and reporting procedures interpreted and understood according to standard enterprise procedures
3.	Interpret emergency procedures	3.1 Method of contacting the appropriate personnel and emergency services in the event of an accident is appropriate to enterprise requirements
		3.2 Emergency and evacuation procedures are interpreted and understood to ensure safe conduct of personnel according to enterprise procedures
		3.3 Use of emergency equipment is correctly identified to comply with regulatory or enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Requirements for conduct of safe work include:**
- Applying general duty of care under WHS legislation and common law
 - Fluid and gas high and low pressure systems, including fluid handling (for example, hydraulic fluids, lubricants, compressed air, nitrogen and oxygen)

- Fuelling/defuelling and working on fuel systems
 - Using and handling chemicals, including solvents and battery acids
 - Electrical systems, outlets and leads
 - Noise hazard areas and aircraft safety zones
 - Aircraft handling, towing, jacking, ground equipment operation and signage
 - Personal protection
 - Housekeeping and cleaning, waste disposal and foreign object damage (FOD) prevention practices and procedures
 - Confined space entry (where applicable to the enterprise)
 - Aircraft strobe lighting (where applicable to the enterprise)
 - Ionising and non-ionising radiation equipment (where applicable to the enterprise)
 - Commonwealth, State and Territory WHS Acts, regulations and codes of practice, including regulations and codes of practice relating to hazards present in the workplace or industry
 - Organisational safety manuals that specify provisions relating to roles and responsibilities of health and safety representatives and/or WHS committees and provisions relating to WHS issue resolution
 - Maintenance organisation manuals
 - Procedures manuals
 - Work instructions
 - Relevant Defence instructions
 - Civil Aviation Safety Regulations (CASRs)
 - Material safety data sheets (MSDS)
 - Safety manuals
 - Procedures manuals
 - Maintenance manuals
 - Work instructions
 - Relevant Defence instructions
 - Checking equipment or the work area before work commences and during work
 - Workplace inspections
 - Housekeeping
- Relevant regulatory and enterprise policies and procedures are found in:**
- Personal protective equipment (PPE) requirements are found in:**
- Workplace hazard identification includes:**

Unit Mapping Information

Release 1 – supersedes and is equivalent to MEA101B Interpret occupational health and safety practices in aviation maintenance

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA101 Interpret work health and safety practices in aviation maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- correctly interpreting WHS regulations, instructions and procedures relevant to the requirements for conduct of safe work listed in the Range of Conditions
- recognising and adhering to aerospace industry signage, including aircraft systems plumbing markings
- recognising and reporting to designated personnel hazardous situations in the workplace
- risk assessment and control
- selecting appropriate PPE for the maintenance activity being undertaken
- correct interpretation of enterprise and regulatory emergency procedures
- correct identification and operation of enterprise/industry-specific workplace emergency equipment.

This unit must be related in its assessment and application to all other units. The relationship between general workplace WHS requirements, as included in enterprise procedures, and the relevant federal and/or state and territory legislation must be clearly linked.

Evidence of knowledge and skills associated with the application of WHS standards is required to supplement evidence of ability to interpret and apply specific safe practices in the workplace.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the applicable sources of WHS requirements and procedures and their application in requirements for conduct of safe work as listed in the Range of Conditions
- how to recognise and report hazardous situations in the workplace
- methods of risk assessment and control
- the preferred order of ways to control risks (known as the hierarchy of control)
- work operations to control risks, e.g. permit to work systems, such as confined space entry and isolation procedures
- how to determine requirements for PPE associated with maintenance activities

- the correct selection and use of workplace emergency equipment
- action to be taken in emergency situations.
-

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. Should a demonstration of skill application be necessary, the candidate must have access to all necessary tools, equipment, materials and relevant documentation. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
- 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 under routine supervision on at least one item from each of:
 - applying general duty of care under WHS legislation and common law
 - fluid and gas high and low pressure systems, including fluid handling (for example, hydraulic fluids, lubricants, compressed air, nitrogen and oxygen)
 - fuelling/defuelling and working on fuel systems
 - using and handling chemicals, including solvents and battery acids
 - electrical systems, outlets and leads
 - noise hazard areas and aircraft safety zones
 - aircraft handling, towing, jacking, ground equipment operation and signage
 - personal protection
 - housekeeping and cleaning, waste disposal and FOD prevention practices and procedures.
- Also, where applicable to the enterprise, the following:
 - confined space entry
 - aircraft strobe lighting
 - ionising, non-ionising radiation equipment
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide. The relationship between general workplace WHS requirements, as included in enterprise procedures, and the relevant federal and/or state and territory legislation must be clearly linked.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA103 Plan and organise aviation maintenance work activities

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires the application of work planning and organising principles that are applied within the framework of defined single or multiple aviation maintenance tasks that involve one or more individuals. Tasks may be performed during scheduled or unscheduled maintenance performed on flight line/tarmac, in hangars and in component workshops. It is applicable to all Aeroskills maintenance training pathways and is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA) during scheduled or unscheduled maintenance.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA105	Apply quality standards applicable to aviation maintenance practices
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|-----------------------------|-----|---|
| 1. | Identify task requirements | 1.1 | Task requirements are determined or confirmed, and clarified to ensure correct interpretation of specifications or requirements |
| 2. | Plan steps to complete task | 2.1 | Task is interpreted and relevant steps are identified to ensure efficient conduct of work to meet specifications in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices |
| | | 2.2 | Steps are planned in conjunction with the work of other personnel to allow achievement of practical outcomes in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices |
| | | 2.3 | Human factors are allowed for in planning of steps |
| 3. | Organise work | 3.1 | Work activity is organised with other involved personnel, allowing for relevant human factors and using relevant communication processes to ensure safe and appropriate sequencing of tasks, including observance of all relevant work health and safety (WHS) requirements and the use of material safety data sheets (MSDS) |
| | | 3.2 | All necessary documentation related to job planning and progress is completed and recorded in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Unit Mapping Information

Release 1 – equivalent to MEA103B Plan and organise aviation maintenance work activities

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA103 Plan and organise aviation maintenance work activities

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- the interpretation of information relating to the work activity from a range of industry manuals, industry and enterprise regulations and industry documentation
- consideration of WHS regulations/precautions specific to the work activity and others working in the vicinity of the planned work activity, particularly with regard to electricity, gases (especially oxygen), oils and chemicals
- the use of MSDS
- the application of human factors in planning maintenance activities.

The relationship between broader planning and organising requirements and service specific procedures must be clearly linked.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the impact of human factors on the safe and effective performance of maintenance on aircraft and aircraft components
- MSDS
- the types of servicings performed on aircraft, i.e. scheduled and unscheduled maintenance activities, and their impact on planning aviation work activity
- aircraft reference numbering systems as an aid to organising effective work activity in terms of related tasks and inspection/servicing zones.

Assessment Conditions

- Competency should be assessed in the work environment or by use of simulated activities, covering planning and organising situations applicable in the aircraft maintenance environment.
- This unit must be related in its assessment and application to all other units, particularly those that apply to the actual maintenance of aircraft.

- Evidence of underlying knowledge and skills associated with the general application of planning and organising while allowing for relevant human factors and WHS requirements is required to supplement evidence of ability to integrate these processes in conjunction with other personnel in the workplace.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on single and multiple tasks involving more than one person. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Implementation Guide).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA105 Apply quality standards applicable to aviation maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of quality standards in the performance of aviation maintenance activities, including flight line/tarmac, hangar and workshop maintenance tasks, either individually or as a member of a team during scheduled or unscheduled maintenance.

The unit is applicable to all Aeroskills Maintenance training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|----------------------------------|---|
| 1. Interpret quality standards | 1.1 Standards or specifications set out in maintenance documents and process specifications are identified and interpreted |
| | 1.2 Enterprise quality requirements are identified and confirmed |
| 2. Apply quality standards | 2.1 Standards are applied appropriately for individual and team-related activities |
| | 2.2 Defects within the quality system are detected and reported in accordance with standard procedures, including workplace hazards |
| | 2.3 Documentation is handled and completed accurately and clearly to enable information to be easily read or interpreted |
| 3. Interpret quality improvement | 3.1 Performance monitoring measures are identified to ensure product or service standards are maintained or improved |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Unit Mapping Information

Release 1 – equivalent to MEA105C Apply quality standards applicable to aviation maintenance processes

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA105 Apply quality standards applicable to aviation maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- the application of workplace hazard reporting and identification procedures
- interpretation and application of information from a range of industry manuals, in particular, amendment status block information, amendment procedures, specification/modification leaflet applicability and changes to drawings
- the correct identification of aircraft hardware, materials and components by marking, part number, size and shape
- being able to differentiate the elements which constitute the system and be able to identify processes, workplace regulations and ISO 9000 compliant documentation and specifications within the workplace environment.

The relationship between broader quality standards requirements and service-specific procedures must be clearly linked. It is essential that actual and potential defects within the quality system are considered, together with ongoing abnormalities of equipment or systems as they affect the quality system.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- typical quality systems and their operation in the workplace
- workplace quality documentation, such as quality manuals, procedures manuals, work instructions and worksheets
- the relationship between the quality system and work health and safety (WHS) requirements, such as workplace hazard reporting
- the relationship between the quality system and identification systems for aircraft hardware, materials and components
- the role of inspection in maintaining aircraft continuing airworthiness and reliability, including ageing aircraft inspection requirements
- how inspection programs are derived and developed
- individual and organisational responsibility associated with 'on condition' maintenance
- inspection terminology and standards of inspection with regard to the quality system

- identifying potential areas for inspection process improvement as a quality system activity.

Assessment Conditions

- Competency should be assessed in the work environment or by use of simulated activities, covering the application of quality standards in situations within the aircraft maintenance environment.
- Evidence of underlying knowledge and skills associated with the general application of quality standards is required to supplement evidence of ability to integrate these processes in conjunction with other personnel in the workplace.
- This unit must be related in its assessment and application to all other units.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision in both single and multiple tasks involving more than one person. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA107 Interpret and use aviation maintenance industry manuals and specifications

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge required for on-aircraft and workshop related activities and is applicable to all Aeroskills training pathways. It covers the competencies required to use and correctly interpret industry manuals, specifications and drawings used in the maintenance and manufacture of aircraft and aircraft components during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Identify and access industry manuals, specifications and drawings | 1.1 Appropriate manuals are identified and accessed for the type of aircraft or component to be maintained |
| | 1.2 Amendment status is clearly established to ensure the |

			correct specifications and procedures are applied
2.	Interpret information	2.1	Relevant chapter or section of manual or drawing is located in relation to the work to be carried out
		2.2	Information is interpreted and procedures to be followed are accurately determined
3.	Apply information	3.1	Work steps are correctly identified in accordance with manual or specification procedures
		3.2	All correct sequencing and adjustments are interpreted in accordance with information contained in industry manuals or specifications
4.	Amend manuals, specifications or drawings	4.1	Manual, specification or drawing changes and/or amendments are incorporated and documented correctly in accordance with statutory regulations and/or enterprise procedures
5.	Store manuals, specifications or drawings	5.1	Manuals, specifications or drawings are stored appropriately to ensure prevention of damage, ready access and updating of information, when required, in accordance with regulatory and/or enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Appropriate manuals include:**
- Aircraft publications, maintenance instruction manuals, process specifications, servicing or service bulletins or structural repair manuals
 - Tooling or equipment manuals, manufacturer's manuals, standard practices, enterprise aviation regulations and publications
 - Illustrated parts catalogues, aircraft wiring manuals or drawings

- Statutory regulations and/or enterprise procedures include:**
- Civil Aviation Regulations (CARs) or Civil Aviation Safety Regulations (CASRs)
 - Applicable Defence Regulations and instructions
 - Maintenance organisation manuals
 - Standing instructions

Unit Mapping Information

Release 1 – equivalent to MEA107B Interpret and use aviation maintenance industry manuals and specifications

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA107 Interpret and use aviation maintenance industry manuals and specifications

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- accessing and interpreting information from industry manuals, including paper-based, microfiche or computer-based media, relating to work activities, including determination of manual amendment status, knowledge of manual structures and locating relevant information/instructions for work activity
- amending industry manuals to reflect current/approved amendment status
- identifying and interpreting information from drawings and diagrams in aircraft maintenance manuals, including component scaling, section, assembly, location, drawing applicability and amendment status from the title block
- correct handling and storage of drawings, manuals and industry media, i.e. microfiche and digital formats
- calculating allowable dimension variations on a component from information in drawing title blocks and drawings
- calculating dimensions from drawings for the purpose of manufacturing aircraft components and hardware.

The transferability of general manual interpretation and use in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices must be clearly established.

Evidence of underlying knowledge and skills associated with the interpretation and use of manuals is required to supplement understanding of the structure and regulatory requirements associated with the aircraft maintenance environment in this area.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the types of industry manuals used in aviation maintenance and types of media
- requirements for custody and upkeep of industry manuals
- techniques for obtaining and applying data contained in industry manuals.

Assessment Conditions

- Competency should be assessed in the work environment, or by use of simulated activities, covering the interpretation and use of enterprise aviation manuals, aircraft publications, process sheets, specifications and drawings applicable to the aircraft maintenance environment.
- This unit must be linked in its assessment and application to those that apply to the actual maintenance of aircraft.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one manual from each of the following groups of publications:
 - aircraft publications, maintenance instruction manuals, process specifications, servicing or service bulletins or structural repair manuals
 - tooling or equipment manuals, manufacturer's manuals, standard practices, enterprise aviation regulations and publications
 - illustrated parts catalogues, aircraft wiring manuals or drawings.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Implementation Guide).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A108 Complete aviation maintenance industry documentation

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the requirements for the completion and processing of documentation during, and on completion of, aviation maintenance activities and is applicable to all Aeroskills training pathways during scheduled or unscheduled maintenance.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

ME A105 Apply quality standards applicable to aviation maintenance processes

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Interpret documentation

1.1 Documentation requirements are determined and accessed, where necessary, from relevant sources in accordance with regulatory and enterprise procedures

- | | | |
|----|------------------------------------|---|
| | 1.2 | Information contained in existing documentation is interpreted correctly and, where necessary, requirements carried out in accordance with regulatory and enterprise procedures |
| 2. | Complete documentation | 2.1 Information requirements for new documentation or updating of existing documentation are determined to allow for accurate completion of records |
| | 2.2 | Documentation is completed accurately and clearly to enable information to be easily read or interpreted |
| 3. | Store and distribute documentation | 3.1 All procedures for storing and distributing documentation are followed to ensure ready access when required in accordance with regulatory and enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Documentation includes:**
- Maintenance logs, overhaul test/check sheets, job history sheets, traveller cards, maintenance reports, irregularity reports, serviceable tags or removal tags
 - Material safety data sheets (MSDS) or material record sheets

- Regulatory and enterprise procedures are found in:**
- Civil Aviation Regulations (CARs) or Civil Aviation Safety Regulations (CASRs)
 - Maintenance organisation manuals
 - Procedures manuals
 - Work instructions
 - Quality manuals
 - Safety manuals
 - Applicable Defence Regulations and instructions
 - Standing instructions

Unit Mapping Information

Release 1 – equivalent to MEA108B Complete aviation maintenance industry documentation

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA108 Complete aviation maintenance industry documentation

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identification and accurate completion of industry documentation associated with aircraft/aircraft component maintenance, repair, overhaul and modification activities and industry regulatory reports
- handling industry documentation appropriately to ensure that records are accurately processed, forwarded and/or stored as required by industry and enterprise regulations.

It is essential that information generated in the process of completing paperwork is in a form which is acceptable to the workplace environment and regulatory requirements in accordance with the relevant aircraft publications/maintenance regulations/orders and standards and practices.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- maintenance practice terminology and the associated relationship with industry documentation, i.e. scheduled and unscheduled servicing, aircraft/component lifing, i.e. on condition, life expired, throwaway, repair and overhaul.

Assessment Conditions

- Competency should be assessed in the work environment, or by use of simulated activities, covering the interpretation, use and completion of aircraft maintenance documentation in the maintenance environment in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices.
- This unit must be linked in its assessment and application to those that apply to the actual maintenance of aircraft.
- Evidence of underlying knowledge and skills associated with the interpretation and completion of paperwork is required to supplement evidence of appropriate levels of literacy and numeracy, associated with presenting clear and concise information.

- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one type of documentation from each of the following groups:
 - maintenance logs, overhaul test/check sheets, job history sheets, traveller cards, maintenance reports, irregularity reports, serviceable tags or removal tags
 - MSDS or material record sheets.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Implementation Guide).
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Links

Companion Volume implementation guides are found in VETNet -
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MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency is applicable to all Aeroskills maintenance training pathways. It requires application of basic hand skills and standard trade practices in the maintenance of aircraft and aircraft components.

The competency applies to the selection and use of hand and power tools and equipment associated with scheduled and unscheduled on-aircraft or workshop-related activities in the aircraft maintenance environment that involve:

- laying out and fabricating simple items from common aircraft materials
- assembling items using a representative range of common types of aircraft attachment hardware for which relevant fits and clearances, appropriate safety locking devices and fasteners, including lockwire, are correctly selected and applied
- assembling/connecting a range of common aircraft connectors and plumbing, applying safety locking devices, where applicable
- assembling/connecting aircraft control cables and applying safety locking devices, where applicable
- the use of lubrication equipment and lubricants.

Work may be performed individually or as part of a team and in accordance with industry standard procedures specified by manufacturers, regulatory authorities or the enterprise.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA105 Apply quality standards applicable to aviation maintenance

processes

MEA108 Complete aviation maintenance industry documentation

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-----------------------------------|---|
| 1. Assess task requirements | 1.1 Available information from relevant documentation and/or other sources, including communication with other personnel, is interpreted and assessed to determine the task and tooling requirements |
| 2. Select tools and/or equipment | 2.1 Hand and/or power tools or equipment, including lubrication equipment and lubricants, are selected for appropriate application to the required task
2.2 All tools and/or equipment to be used are checked for condition or calibration, where necessary
2.3 Unsafe or faulty tools or equipment are identified and marked for repair according to enterprise procedures |
| 3. Use tools and/or equipment | 3.1 Tools and/or equipment are used according to standard practices to ensure the correct outcome is produced
3.2 Tools and/or equipment use is carried out without damage to components or tooling in a safe and efficient manner
3.3 Operational maintenance of tools or equipment is undertaken according to standard workshop procedures |
| 4. Store tools and/or equipment | 4.1 Tools and/or equipment are stored safely and securely in accordance with enterprise procedures |
| 5. Apply standard trade practices | 5.1 Simple items are manufactured using basic engineering hand skills |

- 5.2 Common types of aircraft attachment hardware are correctly selected and used
- 5.3 Common types of safety locking devices and fasteners are correctly selected and used
- 5.4 Aircraft components, devices and hardware are lockwired in the correct manner, using the appropriate wire gauge
- 5.5 Common types of aircraft connectors and plumbing are accurately assembled or connected

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

The use of tools and equipment includes:

- The related manipulative skills required to perform aircraft maintenance in areas where access is extremely limited

Unit Mapping Information

Release 1 – equivalent to MEA109B Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- the correct identification, inspection of, application, use and storage of general and purpose specific hand tools (i.e. spanners, screwdrivers, pliers, hammers, cutting devices, files, punches, drills and marking out tools) that may be found in an aircraft engineering workshop or hangar
- the correct identification, inspection of (including calibration), application, use and storage of precision measuring tools (i.e. micrometers, vernier instruments, feeler gauges, go/no-go gauges) that may be found in an aircraft engineering workshop or hangar. Reading instrument scales must be clearly demonstrated during application of instruments to ensure compliance with specifications
- the correct identification, inspection of, application, operation and storage/servicing of portable and fixed power and machine tools (i.e. drills, presses, grinders, shears, pan breaks) that may be found in an aircraft engineering workshop or hangar
- identification, inspection and use of lubrication equipment
- determination of correct lubricants for specified applications
- identification of common ferrous and non-ferrous aircraft materials
- identification of common aircraft composite and non-metallic materials (other than wood)
- identification of aircraft hardware by markings, part numbers, size, shape and material
- the installation of aircraft hardware using standard practices/techniques to ensure safe security and includes:
 - minimum thread engagement
 - split pinning
 - lockwiring
 - application of locking compounds
 - locking tabs, spring washers
 - lock nuts
- the installation of aircraft hardware using tightening, torquing and tensioning techniques. Calculating setting, reading scales and setting up of torque wrench and/or tensioning devices must be clearly demonstrated before application of wrench or device
- identification of various types of aircraft rigid and flexible plumbing and their connectors

- identification of aircraft control cables and related cable system hardware
- manufacture of simple items using basic hand skills.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- types of standard aircraft hardware and methods of identification, including bolts, nuts, washers, pins (cotter, tapered) and fasteners (rivets and camlocs)
- materials from which hardware is manufactured and its applications, including plain, corrosion resistant and temperature/heat resistant
- types of safety locking devices and their application
- common ferrous and non-ferrous aircraft materials, heat treatment and testing
- characteristics and properties of common composite and non-metallic materials other than wood
- types of aircraft cable, turnbuckles, end fittings, tensiometers, pulleys and cable system components, and aircraft flexible control systems
- types and characteristics of lubricants
- types and uses of lubrication equipment
- fits and clearances
- laying out of simple items for manufacture using basic hand skills
- hand and power tool storage and maintenance requirements
- tool calibration requirements
- WHS requirements relevant to the use of hand and power tools.

Assessment Conditions

- Competency should be assessed in the work environment, or by use of simulated activities, using tools and equipment specified by aircraft manuals as well as general purpose tools and test equipment found in most routine situations.
- This unit must be linked in its assessment and application to those units that apply to actual maintenance of aircraft. It is essential that all WHS requirements are met and understood.
- Evidence of knowledge about how tools and equipment are selected, used and maintained is essential. The ability to manipulate tools and equipment correctly in the performance of tasks is necessary to demonstrate transferability of hand skills across a variety of applications.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the following tasks:
 - laying out and fabricating simple items from common aircraft materials

- assembling items using a representative range of common types of aircraft attachment hardware for which relevant fits and clearances, appropriate safety locking devices and fasteners, including lockwire, and applicable lubricants are correctly selected and applied
- assembling/connecting a range of common aircraft connectors and plumbing, applying safety locking devices, where applicable
- assembling/connecting aircraft control cables and applying safety locking devices, where applicable.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Implementation Guide).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA111 Perform administrative processes to prepare for certification of civil aircraft maintenance

Modification History

Release 1 - New unit of competency

Application

This is one of the units of competency that must be attained to progress from Aircraft Maintenance Engineer (AME) to the grant of a maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the Part 66 Manual of Standards. It covers the competencies required to correctly interpret and apply Civil Aviation Safety Authority (CASA) airworthiness and certification requirements during aircraft scheduled or unscheduled maintenance.

The skills and knowledge covered by the units of competency at Certificate IV level listed in the MEA Aeroskills Training Package for the qualification leading to the applicable maintenance certification licence sought are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics listed in the Part 66 Manual of Standards.

Applications include all maintenance tasks that require certification by a Licensed Aircraft Maintenance Engineer (LAME).

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---|---|
| 1. Determine the registration status of an aircraft | 1.1 Registration status is determined in accordance with CASR Part 47 |
|---|---|

- | | | |
|----|--|---|
| | 1.2 | The person responsible for airworthiness and maintenance control is identified |
| 2. | Determine eligibility to certify the completion of aircraft maintenance activities | 2.1 Eligibility to certify in terms of licence privileges is established in accordance with CASR Parts 42, 145 and 66 |
| | 2.2 | Eligibility to certify in terms of the Aviation Maintenance Organisation (AMO) Class/Rating is established in accordance with CASR Part 145 and Part 42 Subpart F |
| 3. | Prepare for return of aircraft to service | 3.1 Completion of all scheduled and unscheduled maintenance activities is coordinated in accordance with CASR Parts 42 145, 66 and the approved maintenance program |
| | 3.2 | The requirement for a maintenance test flight is determined |
| | 3.3 | Documentation is prepared for return of aircraft to service in accordance with CASR Part 42 and/or 145 and the approved maintenance program |
| 4. | Compile and process maintenance documentation and reports | 4.1 Maintenance documentation is raised and compiled for certification |
| | 4.2 | Configuration management procedures are applied |
| | 4.3 | Maintenance-related reports are compiled and processed |
| | 4.4 | Technical communication activities, both oral and written, are performed |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Note

Range statements listed below are numbered to facilitate precise specification of the assessment requirements included in the Assessment Conditions

Certification tasks

The competency applies to the certification of aircraft maintenance activities, including:

1. Scheduled maintenance
2. Unscheduled maintenance
3. Configuration changes
4. Modification incorporation
5. Repairs

In performing Tasks 1 to 5, knowledge is to be applied with regard to airworthiness regulatory systems and Australian legislation, and the application of compliance requirements in the performance, recording and certification of maintenance activities, as follows:

6. International and national regulatory bodies and recognition agreements, including bilateral agreements
7. Australian airworthiness regulatory bodies and the legislative framework
8. The basis of airworthiness certification and determination of non-conformity
9. Procedures for release of aircraft to service following maintenance, including the determination of the requirement for a maintenance test flight
10. Procedures for certification of scheduled and unscheduled maintenance activities
11. Procedures for certification of the incorporation of modifications
12. Procedures for certifying the completion of repairs
13. Determining and applying configuration management procedures, including the weighing of aircraft and the determination of the centre of gravity
14. Compiling and processing service difficulty reports
15. Compiling and processing technical investigation reports
16. Compiling and processing condition reports
17. Orally communicating on technical and airworthiness compliance topics
18. Communicating in writing on technical and

airworthiness compliance issues

Unit Mapping Information

Release 1 – equivalent to MEA111C Perform administrative processes to prepare for certification of civil aircraft maintenance

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA111 Perform administrative processes to prepare for certification of civil aircraft maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

It is essential that airworthiness compliance requirements are interpreted and fully applied without error.

Evidence is required of underlying knowledge and skills associated with the application of airworthiness legislation and compliance requirements, along with evidence of appropriate levels of English literacy and oral expression associated with presenting clear and concise information.

Skills must be demonstrated in:

- describing and applying the requirements applicable to the privileges of their authority
- application of Airworthiness Directive (AD) requirements under CASR Part 39
- application of maintainers' responsibilities under CASR Parts 42, 66 and 145
- compliance with CASR Part 45 Subpart D
- application of aviation maintenance personnel licensing requirements under CASR Part 66
- application of requirements related to conduct and issue of maintenance certifications and Certificates of Release to Service for the aircraft or aeronautical product under CASR Parts 42, 66 and 145
- demonstrating a familiarity with requirements related to the tasks and functions they may perform
- demonstration of literacy and oral expression skills required for clear written and oral communication.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- AD requirements under CASR Part 39
- maintainers' responsibilities under CASR Parts 42, 66 and 145
- aircraft registration and markings under CASR Parts 45–47
- aviation maintenance personnel licensing requirements under CASR Part 66
- continuing airworthiness requirements under CASR Part 42
- maintenance organisations requirements under CASR Part 42 Subpart F and Part 145
- design organisations under CASR Part 21 Subpart J
- Maintenance Training Organisations (MTO) under CASR Part 147.

Assessment Conditions

- Competency should be assessed in the work environment under supervision but without intervention for the purpose of Log entries, and/or by use of simulated activities in a CASR Part 147 MTO, covering the interpretation and application of airworthiness control and certification requirements.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision without intervention on a range of tasks fully representative of Groups 1 to 18 in the Range of Conditions. The body of evidence for this unit may be collected and logged during simulated activities at the CASR Part 147 MTO and/or performance during supervised workplace activities, such as Practical Consolidation of Training (PCT) assessments.
- Knowledge must also be demonstrated of the concept of airworthiness that underpins the legislative framework and compliance requirements.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A112 Plan and implement civil aircraft maintenance activities

Modification History

Release 1 - New unit of competency

Application

This unit of competency covers all aviation maintenance activities. It requires application of maintenance planning and management skills to plan, implement, evaluate and report on aviation maintenance activities during scheduled or unscheduled maintenance while complying with all legislative and regulatory requirements. Work may be performed individually or as part of a team.

This is one of the units that must be attained to progress from Aircraft Maintenance Engineer (AME) to the grant of a maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

The skills and knowledge covered by the units of competency at Certificate IV level listed in the MEA Aeroskills Training Package for the qualification leading to the applicable maintenance certification licence sought are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

1. Plan aircraft maintenance activities

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 Maintenance requirements are determined from applicable sources

1.2 Maintenance tasks are analysed and prioritised

- 1.3 Resource requirements are identified and allocated to ensure the timely and efficient completion of maintenance tasks
 - 1.4 Maintenance tasks to be performed are recorded in a maintenance schedule in accordance with enterprise policies and procedures
 2. Implement aircraft maintenance activities
 - 2.1 Roles and responsibilities of maintenance personnel are communicated and agreed
 - 2.2 Resources and equipment required to perform maintenance tasks are identified and arranged
 - 2.3 Regular liaison with maintenance personnel is maintained to ensure scheduled/unscheduled tasks are being completed and continuity is maintained
 - 2.4 Management/stakeholders are provided with regular updates on maintenance progress in the form of both written and verbal reports, including notes, worksheets, status reports, briefs and individual directives, as required
 - 2.5 Maintenance activities are monitored to ensure compliance with prescribed instructions, policies, procedures and/or regulatory requirements
 - 2.6 Advice and assistance with maintenance activities is provided, as required
 - 2.7 Maintenance problems are resolved in accordance with the approved maintenance data
 - 2.8 Proposed changes to the maintenance schedule are processed and negotiated with management/stakeholders
 3. Evaluate and report maintenance outcomes
 - 3.1 Final maintenance outcomes are evaluated against the schedule in accordance with enterprise policies and procedures
 - 3.2 Maintenance reports are collated, evaluated and forwarded to appropriate management personnel in accordance with enterprise policies and procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

<p>Maintenance requirements are determined from any or all of:</p>	<ul style="list-style-type: none"> • Maintenance releases • Manufacturers' maintenance manuals and servicing schedules • Computer maintenance data systems • Service bulletins • Modification incorporation instructions • Repair instructions • Feedback from maintenance personnel and aircrew via Technical Logs or approved maintenance documentation • Aircraft Maintenance Organisation (AMO) internal work instructions or directives • Airworthiness Directives (ADs)
<p>Resource requirements include:</p>	<ul style="list-style-type: none"> • Required numbers of personnel and their availability • Personnel qualifications, experience and authorisations
<p>Resources and equipment required to perform maintenance tasks include:</p>	<ul style="list-style-type: none"> • Personnel • Spares • Lubricants • Consumables • Tools • Special equipment • Personal protective equipment (PPE) • Associated equipment including various items of ground support equipment
<p>Prescribed instructions, policies, procedures and/or regulatory requirements include:</p>	<ul style="list-style-type: none"> • Manufacturers' operating and maintenance manuals • CASA-approved enterprise operation manuals • Quality procedures and work instructions • Work health and safety (WHS) policies and instructions, including material safety data sheets (MSDS) • Management directives
<p>Advice and assistance in maintenance activities</p>	<ul style="list-style-type: none"> • Fault diagnosis procedures • Troubleshooting

include:	<ul style="list-style-type: none"> • Damage assessment • Assessment of repair cost effectiveness • Assessment of replacement options • Technical services advice or directives
Maintenance problems include:	<ul style="list-style-type: none"> • Lack of resources • Unanticipated breakdowns or faults • Changes in priorities
Maintenance activities include:	<ul style="list-style-type: none"> • Scheduled maintenance • Unscheduled maintenance • Configuration changes • Modification incorporation • Repair

Unit Mapping Information

Release 1 – equivalent to MEA112B Plan and implement civil aircraft maintenance activities

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA112 Plan and implement civil aircraft maintenance activities

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- application of the procedures for the identification of specific maintenance requirements through the review of:
 - maintenance releases
 - manufacturers' maintenance manuals and servicing schedules
 - computer maintenance data systems
 - service bulletins
 - modification incorporation instructions
 - repair instructions
 - feedback from maintenance personnel and aircrew via Technical Logs or approved maintenance documentation
 - AMO internal work instructions or directives
 - ADs
- basic project planning techniques, including planning chart development, timing, prioritising, resourcing, monitoring, performance measurement and evaluation of maintenance tasks
- financial and inventory management as an element of task planning
- the basic function, components, operation and interrelationship of all aircraft systems for the initial rating sought
- problem solving techniques and troubleshooting procedures
- damage assessment philosophies and procedures, particularly with regard to corrosion damage
- cost control during maintenance, including cost effectiveness considerations for different repair types
- philosophies and considerations in repair versus replacement options
- the application of quality management systems in aircraft maintenance
- enterprise and regulatory requirements for undertaking, recording and reporting maintenance activities, including relevant WHS requirements and the use of PPE.

It is essential that maintenance requirements are fully identified and that all applicable aspects of planning and implementation are identified and applied to meet organisational priorities and minimise workplace disruptions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- methods of determining and specifying maintenance requirements (Maintenance Review Board (MRB), Maintenance Standards Group (MSG), Extended Range Twin Engine Operations (EROPS), RVSM, Maintenance Programs, Minimum Equipment List (MEL), reliability, Air Transport Association (ATA) codes)
- the procedures for the identification of specific maintenance requirements through the review of:
 - maintenance releases
 - manufacturers' maintenance manuals and servicing schedules
 - computer maintenance data systems
 - service bulletins
 - modification incorporation instructions
 - repair instructions
 - feedback from maintenance personnel and aircrew via Technical Logs or approved maintenance documentation
 - AMO internal work instructions or directives
 - ADs
 - the regulations governing aircraft maintenance coordination
- basic project planning techniques, including planning chart development, timing, prioritising, resourcing, monitoring, performance measurement and evaluation of maintenance tasks
- financial and inventory management as an element of task planning
- the basic function, components, operation and interrelationship of all aircraft systems for the initial rating sought
- problem solving techniques and troubleshooting procedures
- damage assessment philosophies and procedures, particularly with regard to corrosion damage
- cost control during maintenance, including cost effectiveness considerations for different repair types
- philosophies and considerations in repair versus replacement options
- the application of quality management systems in aircraft maintenance
- enterprise and regulatory requirements for undertaking, recording and reporting maintenance activities, including relevant WHS requirements and the use of PPE.

Assessment Conditions

- Competency should be assessed under supervision without intervention in the work environment, and/or by use of simulated activities in a CASR Part 147 Maintenance Training Organisation (MTO), covering the full range of maintenance planning and implementation. This unit must be linked in its assessment and application to those that apply to the exercise of Aircraft Maintenance Engineer Licence or Aircraft Maintenance Specialist Certificate privileges in the actual maintenance of aircraft.
- Evidence is required of underlying knowledge and skills in the planning and implementation of maintenance activities, and in the associated compliance with airworthiness regulatory requirements.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved on a task representing each of:
 - determining maintenance requirements
 - identifying personnel resource requirements
 - identifying resources and equipment required to perform maintenance tasks
 - providing regular updates on progress of tasks
 - identifying and applying prescribed instructions, policy, procedures and/or regulatory requirements
 - providing advice and assistance in maintenance activities
 - resolving maintenance problems.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA113 Supervise civil aircraft maintenance activities and manage human resources in the workplace

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of supervisory and personnel management skills in the performance of all aviation maintenance activities.

This is one of the units that must be attained to progress from Aircraft Maintenance Engineer (AME) to the grant of a maintenance certification licence. It covers the competencies required to supervise maintenance activities, apply human resource management practices applicable at the supervisor level, and contribute to workplace training and competency assessment during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The skills and knowledge covered by the units of competency at Certificate IV level listed in the MEA Aeroskills Training Package for the qualification leading to the applicable maintenance certification licence sought are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the Civil Aviation Safety Regulation (CASR) Part 66 Avionics or Mechanical Syllabus subjects/topics.

Pre-requisite Unit

Competency Field

Supervision of aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-------------------------------|--|
| 1. Plan maintenance for teams | 1.1 Maintenance tasks are identified and interpreted from available maintenance data or schedules in accordance with enterprise procedures |
|-------------------------------|--|

- 1.2 Workload is organised in order of priority taking into consideration, where applicable, mandatory and optional maintenance tasks
- 1.3 Timeframes are taken into consideration when prioritising maintenance tasks
- 1.4 Required resources are obtained to facilitate planned maintenance tasks
- 2. Implement maintenance for teams
 - 2.1 Maintenance tasks are allocated to appropriate team members with consideration of individual's experience and qualifications
 - 2.2 Personnel are clearly briefed on their responsibility and function in the team
 - 2.3 Team members are correctly authorised to operate the required items of ground support equipment
 - 2.4 Team members are instructed to observe work health and safety (WHS) requirements and all safety hazards are promptly identified and addressed
- 3. Provide guidance
 - 3.1 Guidance is provided to staff, appropriate to the maintenance task and individual's experience, including the communication of relevant maintenance data and procedures
 - 3.2 Guidance is readily available, in person as appropriate to the maintenance task
 - 3.3 Guidance is provided in determining the cause of difficult faults or faults not covered in maintenance manual fault diagnosis guides
- 4. Monitor maintenance quality
 - 4.1 Activities are checked and personnel are guided to ensure that maintenance is performed in accordance with the applicable documentation, policies and procedures
 - 4.2 Completed work, including stages of maintenance, is inspected for serviceability and prepared for certification on applicable documentation
- 5. Perform human resource management activities at the
 - 5.1 Human factors affecting job performance are identified and responded to
 - 5.2 The possibility of maintenance errors is minimised

supervisor level	5.3	Sound teamwork is maintained through an awareness of contributing factors
	5.4	Sound employment relations are maintained
6. Perform workplace training tasks	6.1	On-job training is delivered through the reinforcement of knowledge and skills gained in off-job training and guiding their application to specific on-job maintenance tasks
	6.2	The Supervisor's Verification portion of the Workplace History Sheets (Section 3) of the Log of Industrial Experience and Achievement is completed
	6.3	Expert witness verification of competency for CASR Part 147 Maintenance Training Organisation (MTO) workplace assessors is provided when required

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Maintenance data or schedules include:

- Maintenance records
- Manufacturers' maintenance manuals and servicing schedules
- Computer maintenance data systems
- Service bulletins
- Airworthiness Directives (ADs)
- Modification incorporation instructions
- Repair instructions
- Observations and feedback from maintenance personnel and aircrew via Technical Log entries
- Aircraft Maintenance Organisation (AMO) internal work instructions or directives

Required resources include:

- Personnel
- Spares
- Lubricants

- Consumables
 - Tools
 - Special equipment
 - Personal protective equipment (PPE)
 - Associated equipment including various items of ground support equipment
 - Considerations regarding resources also include:
 - required numbers of personnel and their availability
 - personnel qualifications, experience and authorisations
 - availability of the listed resources
- Guidance in maintenance activities includes:**
- Fault diagnosis procedures
 - Troubleshooting
 - Damage assessment
 - Assessment of repair cost effectiveness
 - Assessment of replacement options
- Human factors affecting job performance include:**
- Individual health and disability
 - Social psychology
 - Time pressure and workload
 - The physical work environment
- The possibility of maintenance errors is minimised through:**
- Varying the extent of supervision according to the nature of the task and work conditions
 - Allowance for qualification and experience levels within the team
 - Allowance for human error and "Murphy's Law" ('If something can go wrong, it will.')
- Employment relations at supervisor level include:**
- Resolution or referral to management of complaints and difficulties
 - Resolution of conflict within the team
 - Absence of team members from the job
 - Maintenance of discipline in the performance of maintenance tasks
 - Allowance for cultural diversity within the team
 - Knowledge of relevant sections of industrial awards, enterprise agreements, and conditions of employment and service that apply to the particular workplace
- Maintenance activities include:**
- Scheduled maintenance
 - Unscheduled maintenance
 - Configuration changes
 - Modification incorporation
 - Repairs
- Prescribed instructions, policy, procedures and/or**
- Manufacturers' operating and maintenance manuals
 - CASA-approved enterprise operation manuals

- regulatory requirements include:**
- Quality procedures and work instructions
 - WHS policies and instructions, including material safety data sheets (MSDS)
 - Management directives

Unit Mapping Information

Release 1 – equivalent to MEA113C Supervise civil aircraft maintenance activities and manage human resources in the workplace

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA113 Supervise civil aircraft maintenance activities and manage human resources in the workplace

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- planning and implementing team maintenance activities
- application of all relevant WHS procedures
- observing human factors in team maintenance activities
- providing guidance to team members
- human resource management at team level
- using and compiling the Log of Industrial Experience and Achievement, including an understanding of:
 - purpose of the Log
 - its structure and content
 - responsibility for making entries therein
 - responsibility for the certification of entries
- explaining the role of CASR Part 147 MTOs in the training and competency assessment process, and of the role of supervisors in assisting workplace competency assessors.

It is essential that maintenance requirements are fully identified and that all applicable aspects of supervision, supervisor level human resource management and involvement in workplace training and competency assessment are identified and applied.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- applicable Commonwealth, state and territory WHS regulations, and enterprise WHS instructions
- the correct use of applicable items of PPE
- the requirement for Confined Space Entry Permits and related training
- applicable MSDS
- Air Transport Association (ATA) 113 Specification for Maintenance Human Factors Guidelines, and of the following human factor elements:

- general factors, including:
 - weaknesses in task design and support
 - motivation and attitudes, task demands and limitations in performance
 - cooperative work, communication and leadership
 - allocation of resources, workload, work conditions and double standards
- aspects relating to the task, including:
 - physical and mental work
 - features of the task which limit efficiency or safety performance, including constraints such as signing-off and shift changeover; time pressures, information sources, trouble shooting methods, tools and equipment
 - task performance levels: skill-based, rule-based and knowledge-based; and the limitations encountered in each category
 - complex and interrelated aircraft systems
- limitations of individual performance, including:
 - the sources and effects of fatigue, detection and countermeasures
 - vision and lighting
 - hearing and noise
 - memory - short and long term
 - claustrophobia and acrophobia
- the influence of external factors, including:
 - maintainability of aircraft
 - guidance availability
 - social environment
 - physical environment, including the effects of extremes of heat and cold, and countermeasures (e.g. limited periods of exposure); noise and fumes; motion and vibration
- the causes of variability in human performance, including:
 - effects of arousal
 - limitations of perception
 - limitations of memory, and management of these
 - limitations of decision-making
 - limitations of motor-functioning
 - information processing
- factors that degrade performance, including:
 - risk motivation
 - individual differences (e.g. depth of training and experience)
 - health
 - alcohol and drugs
- errors in maintenance tasks, including:
 - omissions, incorrect installation and wrong parts
 - assumptions

- error management by minimisation, capture and tolerance
- human factors within groups, including:
 - the distinction between groups and teams; coordination and synergy
 - types of groups: horizontal (same level of personnel) and vertical (different functions)
 - group characteristics; reducing overall task time; coordination
 - team characteristics; performance exceeds sum of individual performances
 - factors which lead to effective working in groups and teams: interaction, participation, open communication, clear expectations, shared leadership and self-assessment
 - team building
 - communication: the process and feedback
- organisational aspects, including:
 - functions and dysfunctionality
 - double standards: professionalism, procedures and time pressure
 - organisational culture, professional culture and work-group culture; and peer pressure
- violation of regulations, procedures and processes, including:
 - organisational failure: latent failure, error-provoking conditions and unsafe acts
 - organisational learning
 - maintenance error management program
- the National MEA Aeroskills Training Package, including relevant units of competency and qualification training pathways.
-

Assessment Conditions

- Competency should be assessed under supervision, without intervention in the work environment, and/or by use of approved simulated activities in a CASR Part 147 MTO, covering the full range of maintenance supervision, supervisor level human resource management and assistance with workplace training and competency assessment, as provided for in the Range of Conditions. This competency standard must be linked in its assessment and application to those that apply to the exercise of Aircraft Maintenance Engineer Licence, or Aircraft Maintenance Technician privileges in the actual maintenance of aircraft.
- Evidence is required of underlying knowledge and skills in the supervision of maintenance activities, and in the associated compliance with airworthiness regulatory requirements. The ability must be demonstrated to apply supervisor level human resource management processes during supervision activities, deliver workplace training, and to record experience and evidence for competency assessment associated with completion of the Log of Industrial Experience and Achievement.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision, without intervention on a maintenance supervision task that includes application across the Range of Conditions of the following:
 - using maintenance data or schedules
 - identifying required resources
 - providing guidance in maintenance activities
 - allowing for human factors affecting job performance
 - minimising the possibility of maintenance errors
 - applying employment relations at supervisor level
 - delivering on-job training.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A114 Certify aeronautical product maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of legislative and regulatory requirements relating to the certification of all aeronautical product maintenance tasks that require certification following completion of maintenance. It must be attained by individuals working in Civil Aviation Safety Regulation (CASR) Part 42 Subpart F and Part 145 maintenance organisations who are authorised to return items of aeronautical product to service after the completion of maintenance during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The units that are specified by the maintenance organisation for the repair, overhaul or modification of the item of aeronautical product being certified for return to service are also required in order to apply this standard.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

1. Comply with airworthiness regulations

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 1.1 The status of aircraft components and component parts is determined
- 1.2 Eligibility to certify the completion of maintenance activities is determined
- 1.3 Item of aeronautical product is released to service
- 1.4 Maintenance documentation required for certification is

raised and compiled

- 1.5 Configuration management (CM) procedures are applied
- 1.6 Maintenance-related reports are compiled and processed
- 1.7 Technical communication activities, both oral and written, are performed

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Maintenance activities include:

- Scheduled maintenance
- Unscheduled maintenance
- Configuration changes
- Modification incorporation
- Repairs

In performing each of the above activities, knowledge is to be applied with regard to airworthiness regulatory systems and Australian legislation, and the application of compliance requirements in the performance, recording and certification of maintenance activities, as follows:

- international and national regulatory bodies and recognition agreements, including bilateral agreements
- Australian airworthiness regulatory bodies and the legislative framework
- the basis of airworthiness certification and determination of non-conformity
- procedures for release of aeronautical product to service following maintenance
- procedures for certification of scheduled and unscheduled maintenance activities
- procedures for certification of the incorporation of modifications

- procedures for certifying the completion of repairs
- determining and applying CM procedures
- compiling and processing service difficulty reports
- compiling and processing technical investigation reports
- compiling and processing condition reports
- orally communicating on technical and airworthiness compliance topics
- communicating in writing on technical and airworthiness compliance issues

Unit Mapping Information

Release 1 – equivalent to MEA114A Certify aeronautical product maintenance

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA114 Certify aeronautical product maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- describing and applying the requirements applicable to the privileges of their authority
- applying Airworthiness Directive (AD) requirements under CASR Part 39
- applying aviation maintenance personnel licensing requirements under CASR Part 66
- applying requirements related to conduct and certification of maintenance under CASR Part 145 and CASR Part 42 Subpart F
- demonstrating a familiarity with requirements related to the tasks and functions they may perform
- demonstrating literacy and oral expression skills required for clear written and oral communication.

It is essential that airworthiness compliance requirements are interpreted and fully applied without error.

Evidence is required of underlying knowledge and skills associated with the application of airworthiness legislation and compliance requirements, along with evidence of appropriate levels of English literacy and oral expression associated with presenting clear and concise information.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- AD requirements under CASR Part 39
- maintainers' responsibilities under CASR Parts 66, 145 and 42 Subpart F
- aviation maintenance personnel licensing requirements under CASR Part 66
- maintenance organisations requirements under CASR Part 145 and 42 Subpart F
- design organisations under CASR Part 21J and the concept of airworthiness
- Maintenance Training Organisations (MTOs) under CASR Part 147.
-

Assessment Conditions

- Competency should be assessed in the work environment under supervision but without intervention for the purpose of Log entries, and/or by use of simulated activities in a CASR Part 147 MTO, covering the interpretation and application of airworthiness control and certification requirements.
- This unit must be linked in its assessment and application to those that apply to the performance of maintenance on the applicable items of aeronautical product.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision without intervention on a range of tasks fully representative of:
 - scheduled maintenance
 - unscheduled maintenance
 - configuration changes
 - modification incorporation
 - repairs.
- In performing each of the above activities, knowledge is to be applied with regard to airworthiness regulatory systems and Australian legislation, and the application of compliance requirements in the performance, recording and certification of maintenance activities, as follows:
 - international and national regulatory bodies and recognition agreements, including bilateral agreements
 - Australian airworthiness regulatory bodies and the legislative framework
 - the basis of airworthiness certification and determination of non-conformity
 - procedures for release of aeronautical product to service following maintenance
 - procedures for certification of scheduled and unscheduled maintenance activities
 - procedures for certification of the incorporation of modifications
 - procedures for certifying the completion of repairs
 - determining and applying CM procedures
 - compiling and processing service difficulty reports
 - compiling and processing technical investigation reports
 - compiling and processing condition reports
 - orally communicating on technical and airworthiness compliance topics
 - communicating in writing on technical and airworthiness compliance issues.
- The body of evidence for this unit may be collected and logged during simulated activities at the CASR Part 147 MTO and/or performance during supervised workplace activities.
- Knowledge must also be demonstrated of the concept of airworthiness that underpins the legislative framework and compliance requirements.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A115 Plan and implement aeronautical product maintenance activities

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to compliance with airworthiness regulatory requirements in the planning, implementation and evaluation of workshop maintenance activities. Activities may relate to the overhaul, repair and modification of items of aeronautical product.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Plan aeronautical product maintenance activities | 1.1 Maintenance requirements are determined from applicable sources |
| | 1.2 Maintenance tasks are analysed and prioritised |
| | 1.3 Resource requirements are identified and allocated to ensure the timely and efficient completion of maintenance tasks |
| | 1.4 Maintenance tasks to be performed are recorded in accordance with enterprise policy and procedures |

2. Implement aeronautical product maintenance activities
 - 2.1 Roles and responsibilities of maintenance personnel are communicated and agreed
 - 2.2 Resources and equipment required to perform maintenance tasks are identified and arranged
 - 2.3 Regular liaison with maintenance personnel is maintained to ensure that tasks are being completed and continuity is maintained
 - 2.4 Management/stakeholders are provided with regular updates on maintenance progress by way of written or verbal communication, including notes, worksheets, status reports, briefs and individual directives
 - 2.5 Maintenance activities are monitored to ensure compliance with prescribed instructions, policy, procedures and/or regulatory requirements
 - 2.6 Advice and assistance with maintenance activities is provided, as required
 - 2.7 Maintenance problems are resolved in accordance with the applicable maintenance documentation
3. Evaluate and report maintenance outcomes
 - 3.1 Final maintenance outcomes are evaluated against the applicable maintenance documentation in accordance with enterprise policy and procedures
 - 3.2 Maintenance reports are collated, evaluated and forwarded to appropriate management personnel in accordance with regulatory requirements, enterprise policy and procedures
 - 3.3 Required maintenance release documentation is packaged with items of aeronautical product that are being released to service

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Resource requirements include:

- Required numbers of personnel and their availability
- Personnel qualifications, experience and authorisations
- Spares
- Consumables
- Special equipment including component test stations
- Ground support equipment
- Personal protective equipment (PPE)
- Technical data

Enterprise policy and procedures are specified in:

- Maintenance organisation manuals
- Organisational policy manuals
- Procedures manuals
- Quality manuals
- Safety manuals
- Defence instructions and standards
- Standing instructions

Regulatory requirements are found in:

- Civil Aviation Regulations (CARs) or Civil Aviation Safety Regulations (CASRs)
- AAP 7001.053 Technical Airworthiness Management Manual

Advice and assistance include:

- Fault diagnosis procedures
- Troubleshooting
- Damage assessment
- Assessment of repair cost effectiveness
- Assessment of replacement options

Maintenance problems include:

- Lack of resources
- Unanticipated breakdowns or faults
- Changes in priorities

Unit Mapping Information

Release 1 – equivalent to MEA115A Plan and implement aeronautical product maintenance activities

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA115 Plan and implement aeronautical product maintenance activities

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria on at least one occasion under the specified conditions of assessment.

Evidence must be provided that, while planning, implementing, evaluating and reporting aeronautical product maintenance, the candidate can:

- communicate appropriately in English
- produce written communications in English to the required level
- undertake planning and problem solving
- manage personnel and resources
- apply regulations, policies and procedures, including work health and safety (WHS).
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- basic project planning techniques
- problem solving techniques
- basic function and theory of operation of applicable items of aeronautical product
- troubleshooting procedures, including test station operation
- cost effectiveness considerations for different repair types
- philosophies and considerations in repair versus replacement options
- enterprise and regulatory requirements for undertaking, recording and reporting maintenance activities
- WHS legislation
- equity, fraud and ethics.
-

Assessment Conditions

- 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 typical aeronautical product maintenance situations are represented in the simulation scenarios and the elements and performance criteria are fully covered across the range of conditions.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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. A person who demonstrates competency in this unit must be able to plan aeronautical product maintenance, manage a workshop performing the maintenance and evaluate and report appropriately the maintenance outcomes.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA116 Apply work health and safety procedures at supervisor level in aviation maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of work health and safety (WHS) Acts, regulations, codes of practice and enterprise WHS procedures during the supervision of all aviation maintenance activities performed on aircraft and in workshops. It is to be applied in combination with all other units of competency in the Diploma of Aeroskills and the Diploma of Aviation Maintenance Management that relate to the supervision of aviation maintenance activities. It also applies to Certificate IV training pathways that lead to supervisory employment.

The unit is part of all training pathways at Diploma level, and at Certificate IV level where the training pathway leads to the responsibility for maintenance supervision.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Supervision of aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Provide information to the work group about WHS and the | 1.1 Relevant provisions of WHS legislation and codes of practice are accurately and clearly explained to the work group |
|--|---|

- | | | |
|--|-----|--|
| organisation's WHS policies, procedures and programs | 1.2 | Information on the organisation's WHS 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 WHS | 2.1 | Organisational procedures for consultation over WHS 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 resolution |
| | 2.3 | The outcomes of consultation over WHS issues are promptly made known to the work group |
| 3. Implement and monitor the organisation's procedures for identifying hazards and assessing risks | 3.1 | Existing and potential hazards in the work areas are identified and reported so that risk assessment and risk control procedures can be applied |
| 4. Implement and monitor the organisation's procedures for dealing with risk | 4.1 | Work procedures to control risks are implemented and adherence to them by the work group is monitored in accordance with workplace procedures |
| | 4.2 | Existing risk control measures are monitored and results reported regularly in accordance with workplace procedures |
| | 4.3 | Inadequacies in existing risk control measures are identified in accordance with the hierarchy of control and reported to designated personnel |
| | 4.4 | Inadequacies in resource allocation for implementation of risk control measures are identified and reported to designated personnel |
| 5. Implement the organisation's procedures for dealing | 5.1 | Workplace procedures for dealing with hazardous events are implemented whenever necessary to ensure that prompt control action is taken |

- | | | |
|--|-----|---|
| with hazardous events | 5.2 | Hazardous events are investigated to identify their cause in accordance with investigation procedures |
| | 5.3 | 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 |
| 6. Implement and monitor the organisation's procedures for providing WHS training | 6.1 | WHS training needs are identified accurately, specifying gaps between WHS competencies required and those held by work group members |
| | 6.2 | Arrangements are made for fulfilling identified WHS training needs in both on and off-the-job training programs in consultation with relevant parties |
| 7. Implement and monitor the organisation's procedures for maintaining WHS records | 7.1 | WHS records for work area are accurately and legibly completed in accordance with workplace requirements for WHS records and legal requirements for the maintenance of records of occupational injury and disease |
| | 7.2 | Aggregate information from the area's WHS records is used to identify hazards and monitor risk control procedures within work area according to organisational procedures and within scope of responsibilities and competencies |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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 and codes of practice include:**
- State/Territory/Commonwealth WHS Acts, regulations and codes of practice, including general duty of care under WHS legislation and common law

The organisation's WHS policies, procedures and programs are included in:

- Relevant defence instructions
- Civil Aviation Safety Regulations (CASRs)
- Requirements for the maintenance and confidentiality of records of occupational injury and disease
- Provisions relating to health and safety representatives and/or WHS committees
- Provisions relating to WHS issue resolution
- Safety manuals
- Maintenance organisation manual
- Standing instructions
- Procedures manuals
- Work instructions

Information is provided:

- For the induction of new maintenance personnel
- About the nature of work, tasks and procedures
- To assist in work tasks
- As part of providing direct supervision
- To communicate organisational safety requirements and procedures
- For consultation with health and safety representatives and WHS committees

Consultation over WHS issues includes:

- Formal and informal meetings which include WHS
- WHS committees
- Other committees, such as consultative, planning and purchasing
- Health and safety representatives
- Suggestions, requests, reports and concerns put forward by employees to management

Assessment of existing and potential hazards and risk includes:

- Audits
- Workplace inspections
- Housekeeping
- Checking work area and/or equipment before and during work
- Job and work system assessment
- Reviews of WHS records, including registers of hazardous substances, dangerous goods, and so on
- Maintenance of plant and equipment
- Provision of supplies and equipment, e.g. review of material safety data sheets (MSDS) and manufacturer/supplier information
- Identifying employee concerns

Risk control procedures include:

- Measures to remove the cause of a risk at its source
- Application of the hierarchy of control:
 - elimination of risk

- engineering controls
 - administrative controls
 - personal protective equipment (PPE)
 - Consultation with maintenance personnel and their representatives
- Procedures for dealing with hazardous events include:**
- Evacuation
 - Chemical containment
 - First aid
 - Accident/incident reporting and investigation
- Hazardous events include:**
- Accidents
 - Fires and explosions
 - Emergencies, e.g. fuel or chemical spills
 - Bomb scares
 - Violent incidents
- WHS training includes:**
- Induction training
 - Specific hazard training
 - Specific task or equipment training
 - Emergency and evacuation training
 - Training as part of broader programs, such as equipment operation
- WHS records include:**
- WHS audit and inspection reports
 - Health surveillance and workplace environmental monitoring reports
 - Records of instruction and training
 - Manufacturers and suppliers information, including MSDS and dangerous goods storage lists
 - Hazardous substances registers
 - Maintenance and testing reports
 - Workers compensation and rehabilitation records
 - First aid/medical post records

Unit Mapping Information

Release 1 – equivalent to MEA116B Apply work health and safety procedures at supervisor level in aviation maintenance

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA116 Apply work health and safety procedures at supervisor level in aviation maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion.

Evidence must be provided that the candidate can apply applicable WHS Acts, regulations and codes to:

- analyse the entire work environment in the area of responsibility in order to identify hazards, assess risks and judge when intervention to control risks is necessary
- analyse relevant workplace data, such as incident or environmental monitoring data, to identify hazards, assess risks and evaluate the effectiveness of risk control measures
- assess the resources needed to apply different risk control measures and make recommendations to management on that basis.

The demonstrated ability to apply the elements and performance criteria of this unit of competency in conjunction with other units relating to the supervision of aviation maintenance activities is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the provisions of WHS Acts, regulations and codes of practice relevant to the workplace, including legal responsibilities of employers, employees and other parties with legal responsibilities
- principles and practices of effective WHS management
- hazard identification and control in the workplace
- organisational WHS management systems, policies and procedures that support organisational compliance with legal requirements
- the impact on WHS management of workforce characteristics and composition
- the relevance of WHS management to other organisational systems, policies and procedures.

Assessment Conditions

- This unit may be assessed through a combination of workplace (or a realistic simulation) and off-the-job assessment. The context of assessment should ensure that evidence relating to the contingency management component of competency can be collected. Evidence must include observation in the workplace as well as off-the-job techniques, such as interviews and simulations. Conditions for simulations should accurately simulate the range of circumstances (especially with regard to a realistic range of emergencies and hazardous events) that the individual could be expected to deal with in the workplace and allow for discussion. The individual must be given access to:
 - relevant WHS Acts, regulations and codes of practice
 - enterprise WHS policies and procedures
 - personal protective equipment
 - relevant work areas for identification of hazards and control measures.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors). The assessor should also have recognised expertise in managing WHS in an aviation maintenance environment or work in an assessment team with such a person.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA117 Apply self in the aviation maintenance environment

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to ethical behaviour, effective work performance and skills development relating to all aspects of aircraft and aircraft component maintenance during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of all Certificate II training pathways. It covers the competencies required to work ethically and effectively in the maintenance of aircraft and aircraft components at Certificate II level while contributing to the development of the individual's own capabilities.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|----------------|--|
| 1. Manage self | 1.1 Responsibility for own workload is accepted |
| | 1.2 Work is undertaken individually or as a team member to complete maintenance tasks in a timely manner and in accordance with enterprise procedures and requirements |
| | 1.3 Initiative is exercised in liaison with colleagues in identifying and analysing alternative approaches to resolving workplace issues and problems |

- | | | |
|--|-----|--|
| | 1.4 | Performance feedback from others is used to improve work performance |
| | 1.5 | Organisational structure, career paths and eligibility criteria are identified |
| | 1.6 | Awareness is maintained of the effects of fatigue, drugs and alcohol on performance |
| 2. Work effectively with others | 2.1 | Effective communication skills are applied in oral and written form, including email |
| | 2.2 | Others are dealt with ethically and principles of diversity applied |
| | 2.3 | The trust and confidence of others is developed and maintained at all levels of the organisation |
| 3. Participate in the process of change and innovation | 3.1 | Work is undertaken with others to implement change in the workplace |
| | 3.2 | Opportunities for product and service enhancement are identified and proposed to supervisors |
| 4. Contribute to development of own skills | 4.1 | Units of competency relevant to current employment are identified and applied |
| | 4.2 | Units of competency required for desired career path progression are identified and action is initiated through enterprise procedures to facilitate their attainment |
| | 4.3 | New ideas and techniques are accepted and time and effort invested in learning new skills |
| | 4.4 | Performance feedback is used to identify and develop ways to improve competence |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Unit Mapping Information

Release 1 – equivalent to MEA117A Apply self in the aviation maintenance environment

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA117 Apply self in the aviation maintenance environment

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion.

Evidence must be provided that the candidate, in relation to performing aviation maintenance, is capable of:

- oral communication in English regarding maintenance issues
- written communication in English, including email, regarding maintenance issues
- applying principles of equity and diversity
- managing own work performance both individually and as part of a team
- interfacing effectively with others in the performance of maintenance and adapting to change
- applying legislation, regulations and organisational policies and procedures relevant to role and workplace
- contributing to own knowledge, skills and competency development for job performance and career progression.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- oral and written communication within the aviation maintenance environment, including email
- human factors relating to fatigue, drugs and alcohol and performance of work as an individual and as a team member
- the application within the workplace of legislative requirements and principles regarding equal opportunity, equity and diversity
- aviation maintenance legislation, regulations and organisational policies and procedures that are relevant to the individual's role and workplace
- MEA Aeroskills Training Package and relevant pathways to qualifications and their application within the enterprise
- problem solving principles
- constant improvement principles and procedures
- enterprise procedures for proposing modifications or changes in work procedures

- change management.

Assessment Conditions

- 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 an appropriate simulation must be used where the range of conditions reflects realistic workplace situations.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- Assessors must be satisfied that the candidate can competently and consistently perform all elements and the performance criteria of the unit, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
- Evidence of competency attainment shall be obtained via the records in the Log of Industrial Experience and Achievement, or where applicable an equivalent industry evidence guide (refer to the Companion Volume Assessment Guidelines).
- Competency in this unit underpins competency in other aspects of the workplace role of employees at Certificate II level. It may be appropriate to assess parts of this unit in conjunction with units relating to the performance of maintenance activities.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA118 Conduct self in the aviation maintenance environment

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to ethical behaviour, self-management and skills development relating to all aspects of aircraft and aircraft component maintenance during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of all Certificate III and IV level training pathways. It covers the competencies required to perform work ethically and efficiently in the maintenance of aircraft and aircraft components at Certificate IV level while contributing to the development of the individual's own capabilities.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

1. Manage self

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 1.1 Responsibility for own workload is assessed, prioritised and accepted
- 1.2 Work is undertaken individually or as a team member to complete maintenance tasks in a timely manner and in accordance with enterprise procedures and requirements
- 1.3 Independence and initiative are demonstrated in

- identifying and solving problems
- 1.4 Initiative is exercised in liaison with colleagues in identifying and analysing alternative approaches to resolving workplace issues and problems
 - 1.5 Own skills and knowledge are evaluated and monitored and confidence is built in own capability, ideas and vision
 - 1.6 Performance feedback from others is used to improve work performance
 - 1.7 Organisational structure, career paths and eligibility criteria are identified
 - 1.8 Awareness is maintained of the effects of fatigue, drugs and alcohol on performance
2. Work effectively with others
 - 2.1 Effective communication skills are applied oral and written, including email, forms in English
 - 2.2 Others are dealt with ethically and principles of diversity applied
 - 2.3 The trust and confidence of others is developed and maintained at all levels of the organisation
 - 2.4 Guidance is provided to other team members as required regarding skills application and maintenance processes
 - 2.5 Advantages, disadvantages and consequences of ideas are identified and considered
 3. Participate in the process of change and innovation
 - 3.1 Work is undertaken with others to implement change in the workplace
 - 3.2 Opportunities for product and service enhancement and options for achieving the desired result are identified and proposed in accordance with enterprise procedures
 4. Contribute to development of own skills
 - 4.1 Units of competency relevant to current employment are identified and applied
 - 4.2 Units of competency required for desired career path progression are identified and action is initiated through enterprise procedures to facilitate their attainment
 - 4.3 Problem solving skills are reviewed for further development

- 4.4 Own personal knowledge and skills are assessed and learning opportunities are accessed as required to fill gaps and enhance skills
- 4.5 New ideas and techniques accepted and time and effort invested in learning new skills
- 4.6 Performance feedback is used to identify and develop ways to improve competence

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Unit Mapping Information

Release 1 – equivalent to MEA118A Conduct self in the aviation maintenance environment

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA118 Conduct self in the aviation maintenance environment

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion.

Evidence must be provided that the candidate, during aviation maintenance activities, is capable of:

- oral communication in English regarding maintenance activities
- written communication in English, including email, regarding maintenance activities
- applying principles of equity and diversity
- managing own work performance both individually and as part of a team
- interfacing effectively with others in the performance of maintenance and adapting to change
- applying legislation, regulations and organisational policies and procedures relevant to role and workplace
- contributing to own knowledge, skills and competency development for job performance and career progression
- provision of guidance to other team members.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- oral and written communication within the aviation maintenance environment, including email
- human factors relating to fatigue, drugs and alcohol and performance of work as an individual and as a team member
- the application within the workplace of legislative requirements and principles regarding equal opportunity, equity and diversity
- aviation maintenance legislation, regulations and organisational policies and procedures that are relevant to the individual's role and workplace
- MEA Aeroskills Training Package and relevant pathways to qualifications and their application within the enterprise
- problem solving principles
- constant improvement principles and procedures

- enterprise procedures for proposing modifications or changes in work procedures
- change management
- methods of providing effective guidance to others in the aviation maintenance environment.
-

Assessment Conditions

- 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 an appropriate simulation must be used where the range of conditions reflects realistic workplace situations.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- Assessors must be satisfied that the candidate can competently and consistently perform all elements and performance criteria of the unit, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
- Evidence of competency attainment shall be obtained via the records in the Log of Industrial Experience and Achievement, or where applicable an equivalent industry evidence guide (refer to the Companion Volume Assessment Guidelines).
- Competency in this unit underpins competency in other aspects of the workplace role of employees at Certificate III or IV levels. It may be appropriate to assess parts of this unit in conjunction with units relating to aircraft or component maintenance activities.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA119 Perform administrative processes to prepare for certification of civil aircraft A level line mainten

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of legislative and regulatory requirements relating to the certification of aviation maintenance within the scope of the A Licence by an Aircraft Maintenance Engineer who holds an A Licence.

This is one of the units of competency that must be attained to progress from Aircraft Maintenance Engineer to the grant of an Aircraft Maintenance Engineer A Licence under Civil Aviation Safety Regulation (CASR) Part 66. It covers the competencies required to correctly interpret and apply Civil Aviation Safety Authority (CASA) airworthiness and certification requirements during aircraft line maintenance tasks within the scope of the A Licence privileges during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The skills and knowledge covered by the units of competency listed in the MEA Aeroskills Training Package for the Certificate II in Aircraft Line Maintenance are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics applicable to the A Licence.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Determine eligibility to certify the completion | 1.1 Eligibility to certify line maintenance activities in terms of licence privileges is established in accordance with |
|--|---|

of aircraft maintenance activities	CASR Parts 42, 145 and 66
2. Prepare for return of aircraft to service	2.1 Allocated line maintenance activities are completed in accordance with CASR Parts 42, 145, 66 and the approved maintenance program 2.2 Documentation is prepared for return of aircraft to service in accordance with CASR Part 42 and/or 145 and the approved maintenance program
3. Compile and process maintenance documentation and reports	3.1 Maintenance documentation is raised and compiled for certification 3.2 Configuration management (CM) procedures are applied 3.3 Maintenance related reports are compiled and processed 3.4 Technical communication activities, both oral and written, are performed

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Note

Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Performance Evidence

Certification of aircraft maintenance activities

The competency applies to the certification of aircraft maintenance activities, including:

1. Scheduled line maintenance up to Weekly Check level or equivalent
2. Unscheduled maintenance involving component removal and installation within the scope of the A Licence
3. Configuration changes that are within the scope of the A

Licence

4. Repairs to internal fittings

Regulatory systems, legislation and compliance

In performing Tasks 1 to 4, knowledge is to be applied with regard to airworthiness regulatory systems and Australian legislation, and the application of compliance requirements in the performance, recording and certification of maintenance activities, as follows:

5. International and national regulatory bodies and recognition agreements, including bilateral agreements

6. Australian airworthiness regulatory bodies and the legislative framework

7. Procedures for release of aircraft to service following maintenance

8. Procedures for certification of scheduled and unscheduled maintenance activities

9. Procedures for certifying the completion of repairs

10. Determining and applying configuration management procedures involving items of removable equipment

11. Compiling and processing service difficulty reports

12. Orally communicating on technical and airworthiness compliance topics

13. Communicating in writing on technical and airworthiness compliance issues

Unit Mapping Information

Release 1 – equivalent to MEA119B Perform administrative processes to prepare for certification of civil aircraft A level line maintenance

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA119 Perform administrative processes to prepare for certification of civil aircraft A level line mainten

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- describing and applying the requirements applicable to the privileges of their authority
- application of Airworthiness Directive (AD) requirements under CASR 39
- application of maintainers' responsibilities under CASR Parts 42, 66 and 145
- compliance with CASR 45 Subpart D
- application of aviation maintenance personnel licensing requirements under CASR 66
- application of requirements related to conduct and certification of maintenance under CASR 145
- demonstrating a familiarity with requirements related to the tasks and functions they may perform
- demonstration of literacy and oral expression skills required for clear written and oral communication.

It is essential that airworthiness compliance requirements are interpreted and fully applied without error.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- AD requirements under CASR 39
- continuing airworthiness requirements of CASR Parts 21 and 42
- maintainers' responsibilities under CASR Parts 42, 66 and 145
- aviation maintenance personnel licensing requirements under CASR 66
- maintenance requirements under the applicable CASR Parts
- maintenance organisations requirements under CASR 145
- the concept of airworthiness that underpins the legislative framework and compliance requirements
- air operations requirements, including:
 - air operators' certificates

- operators' responsibilities, in particular regarding continuing airworthiness and maintenance
- aircraft maintenance program
- minimum equipment lists
- documents to be carried on board
- aircraft placarding
- applicable national and international requirements:
 - management programs, maintenance checks and inspections
 - master minimum equipment lists, minimum equipment list, and dispatch deviation lists
 - ADs
 - service bulletins, manufacturer's service information
 - modification and repairs
 - maintenance documentation, including maintenance manuals, structural repair manuals, illustrated parts catalogue.

Assessment Conditions

- Competency should be assessed in the work environment under supervision but without intervention for the purpose of Journal entries, and/or by use of simulated activities in a CASR Part 147 Maintenance Training Organisation (MTO), covering the interpretation and application of airworthiness control and certification requirements.
- This unit must be linked in its assessment and application to those that apply to the exercise of Aircraft Maintenance Engineer A Licence privileges in the actual maintenance of aircraft.
- Evidence is required of underlying knowledge and skills associated with the application of airworthiness legislation and compliance requirements, along with evidence of appropriate levels of English literacy and oral expression associated with presenting clear and concise information.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision without intervention on a range of tasks fully representative of Groups 1 to 13 in the Range of Conditions. The body of evidence for this unit may be collected and logged during simulated activities at the CASR Part 147 MTO and/or performance during supervised workplace activities.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A120 Manage an aviation maintenance quality system

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of quality system concepts and management procedures within an aviation maintenance organisation, including setting up a quality process and the monitoring and evaluation of quality processes within a quality system during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--------------------------------|---|
| 1. Establish a quality process | 1.1 Organisational structure, work processes and outcomes are identified and defined |
| | 1.2 Operating procedures, job descriptions and supporting documentation are developed |
| | 1.3 Quality control processes/checks are established and documented |
| | 1.4 Aviation regulatory instructions/policies are identified and incorporated into quality system processes and documentation |

- | | | |
|----|--|--|
| 2. | Monitor and evaluate quality processes within a quality system | 1.5 Personnel roles and responsibilities are allocated and communicated |
| | | 2.1 Quality control checks are conducted in accordance with organisational policy and procedures |
| | | 2.2 Non-compliances are identified, analysed and appropriate responses initiated in accordance with air safety management guidelines |
| | | 2.3 Outcomes are recorded and reported in accordance with organisational policy and procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- | | |
|---|--|
| Supporting documentation includes: | <ul style="list-style-type: none"> • Maintenance personnel authorisation workbooks • Duty statements • Standing instructions |
| Aviation regulatory instructions/policies include: | <ul style="list-style-type: none"> • Civil Aviation Regulations (CARs) • Civil Aviation Safety Regulation (CASR), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • AAP 7001.053 Technical Airworthiness Management Manual • Relevant overseas regulations, such as Federal Aviation Regulations or European Aviation Safety Regulations • Work health and safety (WHS) legislation (state/territory and Commonwealth) |
| Organisational policy and procedures are found in: | <ul style="list-style-type: none"> • Maintenance organisation manuals • Maintenance organisation expositions • Procedures manuals • Work instructions • Quality manuals |

- Safety manuals
- Defence instructions
- Australian Air Publications
- Civil Aviation advisory publications and advisory circulars
- Specific aircraft/equipment maintenance manuals
- Inspection schedules and worksheets

Unit Mapping Information

Release 1 – equivalent to MEA120B Manage an aviation maintenance quality system

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA120 Manage an aviation maintenance quality system

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion.

Evidence must be provided that the candidate can manage an aviation maintenance quality system that includes:

- leadership
- research and interpretation of regulations and guidelines
- written communication
- oral communication
- inspecting and auditing
- quality management.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- enterprise authorisation and re-authorisation procedures
- organisational policy and procedures
- enterprise and industry regulatory requirements in monitoring and assessing quality in the aviation maintenance environment
- quality system audit and review requirements and processes
- relevant WHS legislation at state/territory and Commonwealth level
- quality management principles.
-

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered during the management of an aviation maintenance quality system.

- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA121 Manage aircraft/aeronautical product configuration

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of configuration management (CM) procedures specified by applicable regulatory bodies and the organisation. It includes management of weight and balance, role equipment, modification state and of spares authenticity and traceability during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Manage aircraft/aeronautical product configuration | 1.1 Aircraft and aeronautical product maintenance configuration is maintained in accordance with applicable maintenance documentation |
| | 1.2 Aircraft configuration is changed and maintained to meet established role requirements in accordance with airworthiness regulations and organisational policy and procedures |
| | 1.3 Modifications to aircraft and aeronautical product are carried out in accordance with airworthiness regulations and organisational policy and procedures |

- 1.4 Aeronautical product is authenticated and checked for serviceability in accordance with airworthiness regulations and organisational policy and procedures
- 1.5 Locally manufactured components are produced to authorised specifications and technical drawings
- 1.6 Aircraft weight and balance is maintained and validated in accordance with regulatory requirements and organisational policy and procedures
- 1.7 Revised weight and balance data is provided for revision of aircraft loading systems
- 2. Manage maintenance records and documentation
 - 2.1 Maintenance reports and documentation are compiled and despatched in accordance with regulatory requirements and organisational policy and procedures
 - 2.2 Maintenance records and associated documentation are maintained in accordance with organisational policy and procedures
 - 2.3 Deficiencies in documentation are remedied in accordance with organisational policy and procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.	
Maintenance configuration	The maintenance configuration is defined by the original drawings, standards and component fit of the aircraft or aeronautical product, and as subsequently varied by approved modifications or approved component/material substitution
Applicable maintenance documentation includes:	<ul style="list-style-type: none"> • Aircraft/equipment maintenance documentation required by applicable regulations and organisational policy and procedures

	<ul style="list-style-type: none"> • Computer maintenance databases
Aircraft configuration	Aircraft configuration covers the equipment fit for approved operation, including specified role equipment
Airworthiness regulations and organisational policy and procedures include:	<ul style="list-style-type: none"> • Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs) • Civil Aviation Safety Regulation (CASR), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material • AAP 7001.053 Technical Airworthiness Management Manual • Maintenance organisation manuals • Maintenance organisation exposition • Continuing airworthiness management organisation exposition • Maintenance control manuals • Procedures manuals • Work instructions
Evidence of component authenticity includes:	<ul style="list-style-type: none"> • Authorised ADF technical documentation • Original equipment manufacturers documentation • Authorised release certificates • Certificates of conformance • A certifying statement
Maintenance reports and documentation include:	<ul style="list-style-type: none"> • Reports and documents that must be forwarded to CASA as specified by CARs or CASRs • Continuing airworthiness documentation and reports • Computer maintenance database reports • Stores forms • Articles in use accounts • Aircraft/equipment cross-reference records
Maintenance records and associated documentation include:	<ul style="list-style-type: none"> • Aircraft maintenance records • Aeronautical product maintenance records • Completed worksheets

Unit Mapping Information

Release 1 – equivalent to MEA121B Manage aircraft/aeronautical product configuration

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA121 Manage aircraft/aeronautical product configuration

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion.

Evidence must be provided that the candidate can:

- manage aircraft and aeronautical product configuration
- audit aircraft and aeronautical product configuration
- document maintenance activities.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- modification documentation and recording
- weight and balance documentation and recording
- role/alternate mission changes and related maintenance actions
- deviations
- approval processes for local manufacture of components
- procedures for determining authenticity of components
- cannibalisation procedures and impact on configuration.
-

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered in the management of aircraft aeronautical product configuration.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.

- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA122 Manage aircraft/equipment system performance testing

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the use of performance testing in establishing the airworthiness state of aircraft and aircraft systems through means such as aircraft flight testing, engine ground runs, system functional tests and test equipment calibration during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA126 Manage aircraft maintenance activities

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Plan and specify aircraft/equipment systems performance tests

1.1 Aircraft/equipment system performance test requirements are established in accordance with airworthiness regulations, policies and procedures including work health and safety (WHS) requirements associated with engine running and system functional testing

1.2 Aircraft/systems performance tests are programmed in conjunction with appropriate personnel

- 1.3 Aircraft/systems performance test specifications are communicated to appropriate personnel in accordance with organisational policies and procedures
- 1.4 Test equipment calibration is managed in accordance with regulatory requirements and organisational policies and procedures
2. Assess aircraft/equipment systems performance
 - 2.1 Test results are assessed for compliance with test specifications
 - 2.2 Non-compliant test results are identified and diagnosed in consultation with appropriate personnel
 - 2.3 Aircraft/equipment systems are assessed for airworthiness compliance
 - 2.4 Rectification recommendations are produced and reported in accordance with airworthiness policies and procedures
 - 2.5 Test results are documented in accordance with approved guidelines

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aircraft/equipment system performance tests include:

- Engine ground runs
- Maintenance/validation test flights
- System functional testing

Airworthiness regulations, policies and procedures include:

- Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs)
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- AAP 7001.053 Technical Airworthiness Maintenance

Manual

- Airworthiness Directives (ADs)
- Maintenance management plan
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- Procedures manuals
- Work instructions
- Flight test schedules
- Maintenance manuals
- Maintenance test pilots
- Authorised engineering officers
- Authorised airworthiness representatives
- Accountable managers/responsible managers
- Senior maintenance managers
- Continuing airworthiness management personnel
- Authorised maintenance personnel
- Completed test schedules
- Auditable reports

Appropriate personnel include:

Recommendations include:

Unit Mapping Information

Release 1 – equivalent to MEA122B Manage aircraft/equipment system performance testing

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA122 Manage aircraft/equipment system performance testing

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- communicating and consulting
- problem solving
- researching
- report writing
- observing relevant regulatory requirements
- applying work health and safety (WHS) requirements associated with engine ground runs and system functional testing.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- procedures and documentation action for test flights
- procedures and documentation action for engine ground runs
- procedures for functional testing of systems and evaluation of results
- WHS procedures relating to engine ground runs and system functional testing.
-

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered when managing aircraft equipment system performance testing.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.

- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA123 Manage aviation maintenance work environment policy and practices

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of knowledge of relevant regulations and organisational policy and procedures in planning, developing and implementing work practices for use during scheduled or unscheduled maintenance in aviation maintenance workshops, aircraft hangars and on flight lines. Work may be performed individually or as part of a team.

This unit is part of the Aeroskills Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-------------------------------------|---|
| 1. Plan work practices and policies | 1.1 Work practices and policies are planned which emphasise the safety and wellbeing of others and comply with legislation, rules and regulations |
| | 1.2 Guidance from appropriate authorities is sought where necessary |
| | 1.3 Plans are prepared for the implementation of corrective action to remedy identified deficiencies |
| | 1.4 Learning programs are planned to provide personnel |

- with the knowledge and skills required to maintain a safe working environment
2. Control the development and implementation of work practices
 - 2.1 Work practices are developed and implemented within work health and safety (WHS) requirements and industrial agreement provisions
 - 2.2 Employment conditions are interpreted and applied in the work context
 - 2.3 Employees are informed of their obligations and rights under legislation and the organisation's conditions of employment
 - 2.4 Quality standards required by regulations and instructions are maintained in industry/enterprise work practices
 - 2.5 Work practices are adequately communicated to all aviation personnel and performance difficulties are identified
 3. Implement work environment policy and practices
 - 3.1 Responsibility for implementing policies and practices for a clean, safe and healthy work environment is delegated to appropriate personnel in accordance with regulatory requirements and organisational policy and procedures
 - 3.2 Appropriate reporting systems practices are modified to incorporate improvements in maintaining a safe, clean and healthy work environment
 - 3.3 Work practices and procedures are modified on the basis of incident analysis statistics to reduce/eliminate the causative factors
 4. Conduct investigations into injuries and related claim
 - 4.1 Injury reports and associated claims investigations are initiated in the shortest possible time after an incident in accordance with legislative, regulatory and organisational requirements
 - 4.2 Injury and claim statistics are analysed to determine causes and prevent recurrence

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Legislation, rules and regulations include:

- Commonwealth and state/territory WHS legislation
- AAP 7001.053 Technical Airworthiness Management Manual
- Defence instructions and standards
- Standing instructions
- Safety manuals
- Work procedures
- Work instructions
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions

Work practices apply to:

- Plant and machinery
- All personnel present in work areas

Aspects of the work environment include:

- Lighting
- Noise
- Atmospheric contamination
- Physical hazards
- Chemical materials
- Enclosed spaces

Unit Mapping Information

Release 1 – equivalent to MEA123B Manage aviation maintenance work environment policy and practices

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA123 Manage aviation maintenance work environment policy and practices

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- ability to analyse the working environment and develop appropriate work practices
- complying with relevant legislation, rules and regulations
- ability to manage the work environment through delegation of responsibilities to appropriate personnel.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS legislation at Commonwealth and state/territory levels
- enterprise and organisational level WHS policies, rules and procedures
- airworthiness regulations and associated documentation relating to workplaces and work practices.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered during management of aviation maintenance work environment in terms of policy and practice..
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.

- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA124 Coordinate change programs in the aviation maintenance environment

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of management processes that promote and initiate desirable changes that will improve individual and organisational effectiveness in the aviation maintenance environment during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Promote change within workplace practices | 1.1 Change is promoted as an opportunity for improving individual and organisational effectiveness |
| | 1.2 Personnel are encouraged to adopt changes which make improvements in individual and organisational effectiveness |
| | 1.3 Opportunities and threats presented by change are identified and appropriate responses are planned |
| | 1.4 Personnel are involved in designing and implementing |

change within organisational and regulatory guidelines

2. Initiate change where necessary
- 2.1 The proposed initiatives for bringing about improvements are supported within the organisation
 - 2.2 Change for the better is initiated where necessary and is managed in a planned and constructive manner
 - 2.3 Consultative processes are initiated

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Change results from:

- Technology
- Procedures
- Policy
- Government legislation
- Regulations
- Personnel
- Finance
- Ongoing evaluation and feedback

Opportunities include:

- Improved maintenance procedures that decrease maintenance times and/or man-hours
- Improved procedures for the management of maintenance or logistic support activities
- Improvements in physical working conditions
- Adoption of more effective tooling or support equipment
- Improvements to maintenance data

Threats include:

- Adoption of changes that are in violation of regulatory requirements
- Adoption of changes that are in violation of organisational policy or procedures
- Failure to recognise additional training or authorisation requirements

Organisational and regulatory guidelines include:

- Failure to fully comply with relevant work health and safety (WHS) legislation
- Failure to get the full support of all stakeholders, including those in other parts of the overall maintenance and logistic support organisation
- Failure to recognise a need for changes to industrial awards or agreements
- Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs)
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- AAP 7001.053 Technical Airworthiness Management Manual
- Defence regulations and instructions
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- Quality manuals
- Procedures manuals
- Standing instructions
- Work instructions
- WHS legislation (state/territory and Commonwealth)

Initiatives for bringing about improvements arise from:

- Changes to organisational policy and procedures
- Reform of regulations
- Changes to training and authorisation requirements
- Management review processes
- Suggestions from individual stakeholders
- Availability of new tools or support equipment
- Availability of new management technology
- Industry or original equipment manufacturer periodicals and newsletters
- Feedback from other operators of the aircraft type or item of aeronautical product

Consultative processes include:

- Consultation with regulators where the change has a regulatory component
- Consultation with higher management where organisational policy and procedures are involved
- Consultation with stakeholders elsewhere in the logistic support network
- Consultation at all levels in the relevant area of the aviation maintenance environment
- Consultation with stakeholders in the industrial relations system

- Consultation with suppliers of management systems, tooling or support equipment

Unit Mapping Information

Release 1 – equivalent to MEA124B Coordinate change programs in the aviation maintenance environment

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA124 Coordinate change programs in the aviation maintenance environment

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- interpersonal communication
- analysis techniques
- problem solving
- team skills
- monitoring and observation.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- strengths, weaknesses, opportunities, threats (SWOT) analysis
- organisational structure and culture
- policy and procedures
- legislation and regulations
- effects of change in the workplace
- change strategies
- WHS, equity, fraud and ethics.
-

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations when coordinating change programs in aviation maintenance.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.

- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A125 Develop aviation maintenance personnel

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of personnel management practices in the development and training of personnel within the aviation maintenance organisation performing scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

This unit of competency is part of the Aeroskills Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Mediate in and settle grievances and disputes | 1.1 Problem solving issue resolution procedures are conducted in accordance with relevant policy and procedures |
| | 1.2 Grievances and disputes are managed in a timely and respectful manner |
| | 1.3 Grievances and disputes are managed to optimise the likelihood of a favourable outcome for all parties |
| | 1.4 Individual's rights and obligations are respected and communicated in a clear and concise manner |

- 1.5 Interviews and meetings are conducted in a participative and consultative manner
 - 1.6 Outcomes of proceedings are recorded, stored and made available to authorised personnel in accordance with organisational policy and procedures
 2. Motivate team towards achieving quality output
 - 2.1 Team members needs and wants are recognised and where possible incorporated into work assignments consistent with their level of responsibility
 - 2.2 The team's achievements are promoted and rewarded in a way that openly acknowledges the importance of team members' contributions
 3. Control allocation of tasks to teams and individuals
 - 3.1 Tasks are allocated to teams and individuals to take into account the needs of the organisation's operational requirements, individual/team goals, development needs, and individual strengths, qualifications and authorisations
 - 3.2 Prompt corrective action is taken in response to actual or potential significant deviations from plans
 4. Evaluate and report individual performance
 - 4.1 Performance expectations based on an individual's situation and work requirements are identified and agreed
 - 4.2 Individual performance is reviewed on an ongoing basis against performance expectation
 - 4.3 Feedback is provided in a constructive manner
 - 4.4 Reporting on individual performance is in accordance with the organisation's policies and procedures
 - 4.5 Performance issues that cannot be rectified or addressed are referred to appropriate personnel according to the organisation's policies and procedures
 5. Coordinate individual training
 - 5.1 Individual training requirements are identified to meet the needs of the individual and the organisation
 - 5.2 Individual training is delivered
 - 5.3 Opportunities for individuals to develop and apply competencies on the job are facilitated

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Relevant policy and procedures are found in:

- Organisational policy manuals
- Maintenance organisation manual
- Maintenance management plan
- Procedures manuals
- Work instructions
- Government legislation
- Defence regulations and instructions
- Standing instructions
- Grievance procedures
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions

Grievances and disputes include:

- Progress towards qualifications
- Employment area
- Sexual harassment
- Equity and diversity
- Employment conditions
- Interpersonal differences

Qualifications and authorisations include:

- Training Package qualifications issued under the Australian Qualifications Framework (AQF)
- Certificates issued by Registered Training Organisations (RTOs) for completion of non-accredited training courses
- Certificates issued on completion of equipment-related training courses
- Maintenance engineer licences and extensions thereto
- Aviation maintenance specialist certificates
- Authorisations as a CASA representative made under the provision of CARs or CASRs
- Task authorisations made in accordance with maintenance organisation expositions or continuing airworthiness

- management organisation expositions
- Task authorisations made in accordance with relevant Defence regulations and instructions
- Task authorisations made in accordance with a maintenance management plan

Unit Mapping Information

Release 1 – equivalent to MEA125B Develop aviation maintenance personnel

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA125 Develop aviation maintenance personnel

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- negotiation and dispute resolution
- performance appraisal
- interpersonal communication
- interviewing
- planning
- application of requirements regarding matching of allocated jobs with qualification and task authorisations.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant government legislation
- Civil Aviation Regulations (CARs) and Advisory Circulars (ACs)
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- maintenance organisation expositions
- continuing airworthiness management organisation expositions
- relevant Defence Regulations and instructions
- maintenance organisation manuals
- work health and safety (WHS) legislation
- organisational safety manuals
- organisational policy and procedures manuals
- organisational performance appraisal reporting requirements
- personnel development principles and practices
- equity and diversity
- fraud and ethics.

Assessment Conditions

- 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 encountered when developing aviation maintenance personnel.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME126 Manage aircraft maintenance activities

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge required to develop, implement and evaluate the outcomes of aircraft maintenance activities performed on flight lines, in hangars and in workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|------------------------------------|---|
| 1. Develop a maintenance program | 1.1 Maintenance requirements for aircraft are determined from relevant documentation |
| | 1.2 Maintenance tasks are analysed and prioritised |
| | 1.3 Resource requirements are identified and allocated to ensure the timely and efficient completion of maintenance tasks |
| 2. Implement a maintenance program | 2.1 Roles and responsibilities of maintenance personnel are communicated and agreed |
| | 2.2 Appropriate resources and equipment to achieve |

- scheduled tasks are considered and arranged, including relevant material safety data sheets (MSDS) and personal protective equipment (PPE)
- 2.3 Maintenance personnel are regularly consulted to ensure scheduled tasks are being achieved
 - 2.4 Management/stakeholder updates on maintenance progress are provided through verbal reports and briefings, and through written reports, including notes, worksheets and briefs
 - 2.5 Maintenance activities are monitored to ensure compliance with authorised instructions, policies and procedures
 - 2.6 Advice and assistance with maintenance activities are provided as required
 - 2.7 Maintenance problems are identified and/or anticipated and avoided or controlled in accordance with the maintenance program
 - 2.8 Maintenance program effectiveness is reviewed and analysed
 - 2.9 Proposed changes to the maintenance program are identified, investigated and negotiated with management/stakeholders
3. Evaluate and report maintenance outcomes
 - 3.1 Final maintenance outcomes are evaluated against the program in accordance with organisational policies and procedures
 - 3.2 Maintenance reports are collated, evaluated and forwarded to appropriate authorities in accordance with organisational policies and procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Maintenance requirements for aircraft include:

- Maintenance of the airframe and aircraft systems, power plant, avionic systems and fitted role equipment

Relevant documentation includes:

- Computer data systems
- Log books
- Authorised maintenance manuals
- Management directives
- Feedback from maintenance and operating personnel
- Aircraft flight and technical records
- Aircraft maintenance program
- Civil Aviation Regulations (CARs) and Advisory Circulars (ACs)
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Airworthiness Directives (ADs)
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- Aircraft type certificate design certificate
- Relevant Defence regulations and instructions

Maintenance tasks include:

- Scheduled
- Unscheduled
- Preventative
- Corrective

Resource requirements include:

- Personnel
- Spare parts and consumables
- Special equipment
- Ground support equipment, such as power carts and hydraulic rigs
- PPE
- Tools

Considerations regarding resource requirements include:

- Personnel numbers
- Personnel availability
- Personnel qualifications
- Personnel authorisations and experience
- Quantities and availability of parts, consumables special equipment, ground support equipment, PPE and tools

Authorised instructions, policies and procedures

- Manufacturers' operating manuals
- Management directives

include:

- Maintenance manuals
- Defence Regulations and instructions
- Standing instructions
- Maintenance management plans
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- Procedures manuals
- Work instructions
- CARs or CASRs, Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Quality assurance instructions
- Work health and safety (WHS) policies and instructions
- MSDS

Advice and assistance with maintenance activities include:

- Work practices
- Fault diagnosis procedures
- Damage assessment
- Defect investigation
- Assessment of repair cost-effectiveness
- Assessment of repair versus replacement options
- Monitoring of telemetry maintenance data from aircraft during flight operations

Maintenance problems include:

- Lack of resources or data
- Unanticipated breakdowns or faults
- Changes in priorities

Unit Mapping Information

Release 1 – equivalent to MEA126B Manage aircraft maintenance activities

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA126 Manage aircraft maintenance activities

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- using documentation and relevant regulations to determine maintenance and reporting requirements
- using MSDS to determine handling precautions and PPE requirements
- applying WHS requirements
- planning
- communicating
- questioning
- fault diagnosis techniques.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- sources of information relating to scheduled and unscheduled maintenance activities and configuration change requirements
- basic project planning techniques, including timing, prioritising, resourcing, monitoring and evaluation of maintenance tasks
- techniques for mapping maintenance activities and recording progress
- the aircraft and systems being maintained
- fault diagnosis and troubleshooting procedures, damage assessment philosophies and procedures, cost-effectiveness considerations for different repair types, philosophies and considerations in repair versus replacement options
- applicable regulations, organisational policy and procedures manuals, maintenance manuals and instructions
- MSDS
- WHS, equity, fraud and ethics.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered when managing aircraft maintenance activities within the applicable airworthiness regulatory system.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA127 Provide technical advice in the maintenance and management of aircraft and aeronautical product

Modification History

Release 1 - New unit of competency

Application

This unit of competency is applied within the jurisdiction of the Civil Aviation Safety Authority (CASA). It requires application of technical knowledge to provide advice on the need for modifications, repairs and scheduled or unscheduled maintenance requirements for aircraft, aircraft systems and items of aeronautical product.

The unit is part of the Aeroskills Advanced Diploma training pathways.

Pre-requisite Unit

MEA705 Apply basic scientific principles and techniques in aeronautical engineering situations

and

MEA707 Select and test aeronautical engineering materials

OR

MEA706 Apply basic scientific principles and techniques in avionic engineering situations

and

MEA708 Select and test avionic engineering materials

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Develop an aircraft maintenance program and minimum equipment list | 1.1 The requirements for an aircraft maintenance program are determined from relevant regulations, and organisational policies and procedures |
| | 1.2 An applicable maintenance program is identified or is drafted in accordance with regulatory guidelines |
| | 1.3 The proposed maintenance program is submitted for approval |
| | 1.4 The requirement for a minimum equipment list is determined from relevant regulations, and organisational policies and procedures |
| | 1.5 A minimum equipment list is compiled and submitted for approval in accordance with relevant regulations, and organisational policies and procedures |
| 2. Develop a continuing airworthiness management organisation exposition | 2.1 The need for a continuing airworthiness management organisation exposition is determined from relevant regulations |
| | 2.2 A continuing airworthiness management organisation exposition is drafted and submitted for approval in accordance with organisational policies and procedures |
| 3. Develop a maintenance organisation exposition | 3.1 The requirement for a maintenance organisation exposition is determined from relevant regulations |
| | 3.2 A maintenance organisation exposition is drafted in accordance with regulatory guidelines, and organisational policies and procedures |
| 4. Provide mechanical advice in aircraft maintenance | 4.1 Independent technical input is provided with regard to aircraft structure and mechanical systems/components |
| | 4.2 Knowledge of aircraft structures and specialist input is utilised to determine airworthiness |

- | | | |
|----|---|---|
| | 4.3 | Knowledge of aircraft mechanical systems/components and specialist input is utilised to determine airworthiness |
| 5. | Provide avionic advice in aircraft maintenance | 5.1 Independent technical input is provided with regard to avionic systems/components |
| | 5.2 | Knowledge of avionic systems/components and specialist input is utilised to determine airworthiness |
| 6. | Evaluate and review aircraft maintenance and management system elements | 6.1 Aircraft operation and maintenance trends are monitored |
| | 6.2 | Maintenance management system elements are reviewed against trends and amendments are proposed in accordance with regulatory requirements, and organisational policies and procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Relevant regulations and organisational policies and procedures include:

- Civil Aviation Regulations (CARs) and Advisory Circulars (ACs)
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- Policy manuals
- Procedures manuals
- Quality manuals
- Defect investigation and compilation of service difficulty reports
- Modification proposals
- Repair scheme proposals
- Proposed amendments to servicing schedules and

Independent technical input includes:

- maintenance data and programs
- Advice to maintenance personnel, senior maintenance managers and higher technical/regulatory authorities
- Aircraft structure includes:**
 - Primary and secondary structural components
 - Seating and cargo restraints
- Mechanical systems/components include:**
 - Engines and engine systems and components
 - Propellers and propeller system components
 - Landing gear systems and components
 - Hydro-mechanical systems comprising hydraulic, pneumatic, fuel and components
 - Mechanical systems and components
 - Electrical systems and components
 - Oxygen
 - Furnishings and safety equipment
- Specialist input includes:**
 - Professional engineers
 - Non-Destructive Testing (NDT) technicians
 - Licensed Aircraft Maintenance Engineers (LAMEs) with applicable ratings
 - Personnel with Civil Aviation Safety Regulation (CASR) Part 145 or Part 42F certifying authorities
- Avionic systems/components include:**
 - Electrical power generation and distribution
 - Electrical systems
 - Control and warning systems
 - Flight instruments
 - Aircraft data communication
 - Automatic flight and engine control systems
 - Communication systems
 - Navigation systems
 - Radar
 - Role equipment, such as forward looking infra-red (FLIR) pods
- Aircraft operation and maintenance trends are obtained from:**
 - Aircraft flight and technical records
 - Service difficulty reports
 - Maintenance worksheets
 - Log books
 - Continuing analysis maintenance program reports
 - Data from manufacturers and other operators
- Management system elements include:**
 - Aircraft maintenance program
 - Minimum equipment list
 - Continuing airworthiness management organisation exposition
 - Maintenance organisation expositions

Unit Mapping Information

Release 1 – equivalent to MEA127B Provide technical advice in the maintenance and management of aircraft and aeronautical product

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA127 Provide technical advice in the maintenance and management of aircraft and aeronautical product

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- written and oral communication
- using regulations, policies and procedures to set up maintenance control and management systems
- effective use of trend data and specialist advice to determine airworthiness and propose variations to maintenance schedules, repairs and modifications.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- CARs and CASRs relating to aircraft/aeronautical product maintenance and maintenance control
- organisational policies and procedures relating to aircraft/aeronautical product maintenance and maintenance control
- aircraft structure
- mechanical systems and components
- aircraft power plants
- avionic systems and components
- work health and safety (WHS), equity, fraud and ethics.

Assessment Conditions

- 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 an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered when providing advice in the maintenance and management of aircraft and aeronautical product within the CASA airworthiness regulatory system.

- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA128 Provide engineering advice in the modification, maintenance and management of aircraft systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency is applied within the airworthiness jurisdiction of the Australian Defence Force (ADF). It covers the provision of engineering advice in the Defence airworthiness environment on mechanical and avionics systems. The advice is provided in relation to the modification, repair, scheduled and unscheduled maintenance and management of aircraft and associated mechanical and avionic systems.

The unit is part of the Aeroskills Advanced Diploma training pathways.

Pre-requisite Unit

MEA705 Apply basic scientific principles and techniques in aeronautical engineering situations

and

MEA707 Select and test aeronautical engineering materials

OR

MEA706 Apply basic scientific principles and techniques in avionic engineering situations

and

MEA708 Select and test avionic engineering materials

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Provide mechanical systems advice | 1.1 Independent technical input in the maintenance, repair and modification design relating to aircraft mechanical systems and structures is provided when requested by maintenance personnel, senior maintenance managers and higher technical authorities |
| | 1.2 Aircraft mechanical systems knowledge is utilised to determine aircraft airworthiness |
| | 1.3 Knowledge of aircraft structures is utilised to determine aircraft airworthiness |
| 2. Provide avionic systems advice | 2.1 Independent technical input in the maintenance and modification design for aircraft avionic systems is provided when requested by maintenance personnel, senior maintenance managers and higher technical authorities |
| | 2.2 Aircraft avionic systems knowledge is utilised to determine aircraft airworthiness |
| 3. Conduct/advise an aircraft recovery | 3.1 Battle/incident damage and operational capability of an aircraft is evaluated |
| | 3.2 Repair methods and/or limits are determined |
| | 3.3 An aircraft recovery is planned |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Independent technical input is provided:

- Utilising subject matter experts and documented technical information
- Verbally
- In writing
- In accordance with regulations and organisational policy and procedures
- To operators, engineering officers and executive personnel

Aircraft mechanical systems include:

- Engines
- Landing gear systems
- Hydro-mechanical systems comprising oil, fuel, hydraulic and pneumatic
- Furnishings and safety equipment
- Propellers

Aircraft structures include:

- Primary and secondary structure
- Flight controls
- Fairings
- Doors
- Access panels

Aircraft avionic systems include:

- Electrical generation and distribution
- Electrical systems
- Electrical control and warning
- Flight instruments
- Aircraft data communication
- Automatic flight and engine control
- Communications
- Navigation
- Radar
- Life support
- Ordnance

Unit Mapping Information

Release 1 – equivalent to MEA128B Provide engineering advice in the modification, maintenance and management of aircraft systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA128 Provide engineering advice in the modification, maintenance and management of aircraft systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- oral and written communication
- management
- damage assessment, including repair scheme development and/or extension
- development of modification proposals
- review of maintenance requirements.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- modification proposal development and processing
- repair scheme proposal, including equivalent strength repair design and justification for extension of an approved repair scheme
- management processes for monitoring and reviewing maintenance requirements
- aircraft structure
- aircraft mechanical systems
- aircraft avionic systems
- aircraft recovery procedures
- work health and safety (WHS), equity, fraud and ethics.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered when providing engineering advice in the modification, maintenance and management of aircraft systems in the ADF technical airworthiness regulatory system.

- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA129 Investigate technical aspects of aviation occurrences

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of required procedures and of technical knowledge in investigating the technical aspects of aviation occurrences, including aircraft accidents, aircraft incidents and maintenance incidents within the Australian Defence Force (ADF) airworthiness jurisdiction. Work may be performed individually or as part of a team.

The unit is part of Advanced Diploma training pathways.

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-------------------------------------|---|
| 1. Notify authorities of occurrence | 1.1 Authorities are notified of the occurrence in accordance with ADF policy and procedures |
| | 1.2 Specialist advice is provided relevant to the occurrence |
| | 1.3 The investigation is planned in accordance with ADF and statutory requirements |
| 2. Collect evidence | 2.1 Evidence of personnel involved in the occurrence is documented |
| | 2.2 Witnesses are interviewed and information is documented |
| | 2.3 Evidence associated with the occurrence is collated |

- | | |
|----------------------------------|--|
| 3. Analyse occurrence | 3.1 Information is analysed in accordance with the established objectives of the investigation |
| | 3.2 Options for action are generated which are consistent with ADF and/or statutory requirements and lead to recommendations that reduce future risk |
| | 3.3 Criteria are specified to enable objective evaluation of the options to be undertaken |
| 4. Produce report | 4.1 All evidence is reviewed and satisfactory engineering conclusions and recommendations are made |
| | 4.2 Conclusions are reviewed with stakeholders |
| | 4.3 Recommendations are costed |
| | 4.4 Formal reports are produced in accordance with ADF policy and procedures and forwarded to appropriate authorities |
| 5. Implement corrective measures | 5.1 Measures selected for implementation are feasible in terms of practicality and costing |
| | 5.2 Measures are implemented |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Occurrences include:

- Aircraft accidents
- Aircraft incidents
- Maintenance incidents

The investigation can be conducted by any or all of:

- Visual observation
- Interviews
- Review of statements
- Technical investigation

- Formal reports include:**
- Accident and incident reports
 - Safety reports
 - Defect reports
 - Investigation reports

Unit Mapping Information

Release 1 – equivalent to MEA129A Investigate technical aspects of aviation occurrences

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA129 Investigate technical aspects of aviation occurrences

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- oral and written communication
- interviewing
- management and analysis of evidence
- technical aspects relating to the investigation.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- ADF policy and procedures
- investigation procedures
- technical aspects relating to the aircraft type and its systems
- application of a no blame culture
- culpability matrix
- equity, fraud and ethics.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered during the technical investigation of aviation occurrences within the ADF airworthiness regulatory system.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.

- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A130 Manage deployed/detached aviation maintenance activities

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge required to plan deployed aircraft maintenance, provide support to deployed maintenance personnel and monitor and evaluate their activities within the Australian Defence Force (ADF) airworthiness jurisdiction. Applications include the deployment and detachment away from home base of aircraft that are to be supported by a deployed maintenance team for scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of Advanced Diploma training pathways.

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Plan aircraft detachment maintenance activities

- 1.1 Deployment/detachment objectives are ascertained
- 1.2 Resource requirements are identified, obtained and allocated
- 1.3 Maintenance personnel qualifications and authorisations are validated
- 1.4 Liaison with detachment locality authorities is established
- 1.5 Detachment activities are scheduled

- | | | | |
|----|--|-----|---|
| 2. | Prepare maintenance plan | 2.1 | Maintenance plan incorporates short and long-term goals in line with flight/squadron objectives and priorities |
| | | 2.2 | Maintenance plan conforms to airworthiness regulations, ADF policies and procedures |
| | | 2.3 | Realistic and relevant work objectives are developed |
| | | 2.4 | The maintenance plan reflects the resources available |
| 3. | Detach aircraft | 3.1 | Pre-detachment inspections are performed and deficiencies are reported in accordance with ADF policy and procedures |
| | | 3.2 | Personnel briefings are provided |
| | | 3.3 | Aircraft and equipment are despatched |
| 4. | Exercise limited engineering authority | 4.1 | Maintenance interval extension requests are submitted as required |
| | | 4.2 | Carried forward unserviceabilities are authorised |
| 5. | Provide technical airworthiness/engineering advice | 5.1 | Technical advice relating to maintenance and to design of modifications and repairs to aircraft structure/systems is provided to higher authorities |
| 6. | Monitor and evaluate maintenance activities | 6.1 | Maintenance outcomes are assessed against the maintenance plan goals and objectives |
| | | 6.2 | Deviations/problems are identified, analysed and appropriate responses are initiated |
| | | 6.3 | Maintenance outcomes are recorded and reported in accordance with ADF policy and procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Deployment/detachment sites include:**
- Military airfields within Australia or overseas
 - Civilian airfields within Australia or overseas
 - Unprepared areas of operations within Australia and overseas
- Resource requirements include:**
- Personnel
 - Spare parts/fly-away kits
 - Ground support equipment
 - Facilities
 - Vehicles
 - Finance
- Maintenance personnel qualifications and authorisations include:**
- Duty statements
 - Job descriptions
 - Maintenance personnel authorisation workbooks
- Detachment locality authorities include:**
- Military command
 - Location facilities personnel
 - Civilian authorities
 - Other detached units or organisations
- Airworthiness regulations, ADF policies and procedures include:**
- Aircraft maintenance regulations
 - Safety manuals
 - Work health and safety (WHS) legislation
 - Defence instructions
 - Standing instructions
 - Local instructions
 - Specific aircraft/equipment maintenance manuals
 - Servicing schedules
- Pre-detachment inspections include:**
- Facilities/accommodation
 - Fuel
 - Technical facilities
 - Site survey
 - Spare parts
 - Fire-fighting equipment
 - Personal protective equipment (PPE)
- Higher authorities include:**
- Authorised maintenance organisations
 - Authorised engineering organisations
 - Director General Technical Airworthiness
 - Senior commanders

Unit Mapping Information

Release 1 – equivalent to MEA130A Manage deployed/detached aviation maintenance activities

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA130 Manage deployed/detached aviation maintenance activities

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- planning
- communication
- problem solving
- liaison
- management.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- airworthiness regulations
- relevant instructions
- aircraft maintenance documentation
- maintenance report compilation
- modifications and deviations
- defects and safety reports
- equity, fraud and ethics.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations that are encountered in managing deployed/detached aviation maintenance within the ADF airworthiness regulatory environment.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.

- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA131 Manage the custody, transfer and disposal of aircraft, aeronautical product and support equipment

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of procedures relating to the custody, transfer and disposal of aircraft, aeronautical product and support equipment, including test equipment and ground support equipment, used in scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Advanced Diploma training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| <p>1. Maintain proper custody of aircraft, aeronautical product and support equipment</p> | <p>1.1 Aircraft and aeronautical product are maintained and/or stored in facilities or circumstances that comply with regulatory requirements, and organisational policies and procedures</p> <p>1.2 Special test equipment is stored in appropriate environmental conditions and calibration is carried out at required intervals</p> <p>1.3 Ground support equipment is stored and operated in an</p> |
|---|---|

- environment that will prevent undue deterioration or wear
- 1.4 Storage and control requirements are observed for hazardous and controlled materials
 - 1.5 Maintenance records and documentation are maintained in accordance with regulatory requirements, and organisational policies and procedures
2. Transfer aircraft, aeronautical product and support equipment between organisations
 - 2.1 Aircraft, aeronautical product and support equipment are transferred between organisations in accordance with regulatory requirements, and organisational policies and procedures
 - 2.2 Documentation and maintenance records are transferred between organisations in accordance with regulatory requirements, and organisational policies and procedures
3. Dispose of aircraft, aeronautical product and support equipment
 - 3.1 Aircraft, items of aeronautical product and support equipment are correctly classified for disposal and appropriate documentation is compiled to allow disposal in accordance with regulatory requirements, and organisational policies and procedures
 - 3.2 Aircraft and items of aeronautical product are prepared as directed for disposal
 - 3.3 Maintenance records and documentation are retained and stored in accordance with regulatory requirements, and organisational policies and procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Regulatory requirements,

- Civil Aviation Regulations (CARs) and associated

**and organisational policies
and procedures include:**

- Advisory Circulars (ACs)
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- Policy manuals
- Procedures manuals
- AAP 7001.053 Technical Airworthiness Management Manual
- Defence Regulations and instructions
- Maintenance management plans
- Standing instructions

**Special test equipment
includes:**

- Measuring equipment
- Non-Destructive Testing (NDT) equipment
- System test boxes
- Test stands
- Automatic test equipment

**Ground support equipment
includes:**

- Power carts
- Hydraulic rigs
- Pneumatic rigs
- Refuelling equipment
- Towing equipment

**Hazardous and controlled
materials include:**

- Chemicals classified as hazardous
- Items, such as Halon fire-extinguishers, that require an Environmental Protection Authority (EPA) licence for storage
- Materials that have EPA standards for storage and use

Unit Mapping Information

Release 1 – equivalent to MEA131B Manage the custody, transfer and disposal of aircraft, aeronautical product and support equipment

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA131 Manage the custody, transfer and disposal of aircraft, aeronautical product and support equipment

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- administration
- management
- application of technical knowledge in the custody and disposal of aircraft, aeronautical product and support equipment
- compliance with regulatory requirements
- compliance with environmental protection requirements.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft maintenance requirements/instructions
- aeronautical product maintenance requirements
- test equipment calibration requirements
- regulatory requirements relating to custody, transfer and disposal of aircraft, aeronautical product, support equipment and environmental protection
- organisational policies and procedures relating to custody, transfer and disposal of aircraft, aeronautical product and support equipment.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations that would be encountered in managing the custody, transfer and disposal of aircraft, aeronautical product and support equipment under the applicable airworthiness regulatory system.

- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA132 Manage budgetary resources in the aviation maintenance environment

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of procedures for the development and monitoring of a budget for scheduled and unscheduled maintenance in aircraft and aeronautical product maintenance organisations, including engineering and logistic support areas. Work may be performed individually or as part of a team.

It covers the competencies required to manage budgeting activities in aircraft and aeronautical product maintenance and logistic support activities other than major maintenance budgets associated with integrated logistic support (ILS) maintenance programs. Competencies related to these programs are partly covered by MEA139 Perform aviation maintenance-related integrated logistic support management activities. Individuals involved in the management of such programs may, as an alternative to MEA132, consider attainment of PSPMNGT610A Manage public sector financial resources, from the PSP12 Public Sector Training Package. Those who are accountable managers of maintenance organisations may, instead of this unit, consider attaining MEA146 Prepare and manage aviation maintenance organisation budgets and financial plans.

The unit is part of the Aeroskills Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Plan a budget | 1.1 | Workplace resource needs are identified and documented |
| | | 1.2 | Resource needs are costed |
| | | 1.3 | Budget document is prepared and processed in accordance with organisational requirements |
| 2. | Manage the acquisition and allocation of budgetary resources | 2.1 | Systems for monitoring expenditure are maintained |
| | | 2.2 | Budgets are monitored to ensure expenditure is within targets |
| | | 2.3 | Appropriate technology is applied to the resource management system |
| | | 2.4 | Changing priorities are identified and discussed with applicable personnel |
| | | 2.5 | Budget document is amended in response to changing activities or costs |
| | | 2.6 | Accountability requirements are satisfied |
| 3. | Evaluate and report budget outcomes | 3.1 | Expenditure against planned budget is evaluated |
| | | 3.2 | Impacts on financial changes/constraints on work unit objectives are evaluated and documented |
| | | 3.3 | Report on expenditure/budget is prepared in accordance with organisational policies and procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Workplace resource needs • Personnel

include:

- Finance
- Equipment
- Facilities
- Items of aeronautical product
- Breakdown spares and materials
- Consumables

Budgets include:

- Annual
- Length of project/activity
- Quarterly
- For another period of time, as required

Systems for monitoring expenditure include:

- Paper-based systems
- Computerised systems
- Receipts and invoices
- Quotes

Unit Mapping Information

Release 1 – equivalent to MEA132A Manage budgetary resources in the aviation maintenance environment

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA132 Manage budgetary resources in the aviation maintenance environment

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- financial management
- monitoring
- evaluation and decision making
- mathematical calculation.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- organisational budgetary processes
- tasking over the period of the budget
- requirements in Civil Aviation Safety Regulations (CASRs) regarding financial status of maintenance organisations
- fraud and ethics.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations in the management of budgetary resources within the aviation maintenance environment.
- The candidate must have access to all materials and documentation required and must be permitted to refer to any relevant workplace procedures, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.

- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA133 Communicate aviation technical and maintenance management knowledge

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of written and oral communication skills relating to aviation technical and maintenance management knowledge. Applications include the evaluation of written technical communication and the delivery of verbal briefings during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Diploma and Advanced Diploma training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Evaluate written technical communication | 1.1 Content of written technical communication is checked for accuracy and appropriateness |
| | 1.2 Format is checked against regulatory requirements, and organisational policies and procedures |
| | 1.3 The need for additional information is identified and writer advised of same |

- | | | |
|----|---|---|
| | 1.4 | Verified communication is actioned in accordance with regulatory requirements, and organisational policies and procedures |
| 2. | Present technical and non-technical briefings | 2.1 Briefing is planned and prepared in a well-structured manner |
| | 2.2 | Briefing is delivered in an audible, articulate manner |
| | 2.3 | Information delivered is accurate |
| | 2.4 | Audiovisual equipment, where applicable, is used in an effective, professional manner |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Written technical communication includes:

- Instructions
- Reports
- Requests being submitted in accordance with regulatory requirements

Regulatory requirements, and organisational policies and procedures include:

- Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs)
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- Policy manuals
- Procedures manuals
- Quality manuals
- Work instructions
- AAP 7001.053 Technical Airworthiness Maintenance Manual

Briefings are conducted for:

- Defence instructions
- Standing instructions
- Maintenance management plans
- Employees of the organisation
- Business associates, such as teaming partners
- Clients
- Contractors and subcontractors
- Representatives of regulatory bodies
- Higher authorities
- Visitors

Information includes:

- Changes to policy and procedures or regulations
- Workload requirements
- Organisational activities
- Organisational familiarisation
- Technical knowledge and skills
- Work procedures
- Non-technical matters

Unit Mapping Information

Release 1 – equivalent to MEA133B Communicate aviation technical and maintenance management knowledge

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA133 Communicate aviation technical and maintenance management knowledge

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- oral communication
- written communication
- evaluation
- planning of briefings and use of aids to delivery.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- applicable technical aspects
- requirements for written communication
- planning and delivery of briefings.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations that would be encountered in planning, preparing aids and delivering briefings relating to aviation maintenance activities .
- The candidate must have access to all equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.

- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA134 Establish, maintain and evaluate the organisation's work health and safety system

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of work health and safety (WHS) legislation and principles to establish, maintain and evaluate a WHS system within the maintenance organisation, including on flight lines, in hangars and in workshops, during scheduled or unscheduled maintenance and may relate to individual and team activities. It is intended to ensure that the workplace is, so far as is practicable, safe and without risks to the health of employees.

The unit is part of the Aeroskills Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Work health and safety

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Establish and maintain the framework for the WHS system | 1.1 WHS policies are developed which clearly express the organisation's commitment with respect to WHS within the area of managerial responsibility and how relevant WHS legislation will be implemented, consistent with overall organisational policies |
| | 1.2 WHS responsibilities and duties which will allow implementation and integration of the WHS system are clearly defined, allocated and included in job descriptions |

and duty statements for all relevant positions

- 1.3 Financial and human resources for the operation of the WHS system are identified and sought in a timely and consistent manner
- 1.4 Information on the WHS system and procedures for the area of managerial responsibility is provided and explained in a form that is readily accessible to employees
2. Establish and maintain participative arrangements for the management of WHS
 - 2.1 Appropriate consultative processes are established and maintained in consultation with employees and their representatives in accordance with relevant WHS legislation and consistent with the organisation's overall process for consultation
 - 2.2 Issues raised through participation and consultation are dealt with and resolved promptly and effectively in accordance with procedures for issue resolution
 - 2.3 Information about the outcomes of participation and consultation is provided in a manner accessible to employees
3. Establish and maintain procedures for identifying hazards
 - 3.1 Existing and potential hazards within the area of managerial responsibility are correctly identified and identification confirmed in accordance with WHS legislation, codes of practice and trends identified from the WHS records system
 - 3.2 A procedure for ongoing identification of hazards is developed and integrated within systems of work and procedures
 - 3.3 Activities are appropriately monitored to ensure that this procedure is adopted effectively throughout the area of managerial responsibility
 - 3.4 Hazard identification is addressed at the planning, design and evaluation stages of any change in the workplace to ensure that new hazards are not created
4. Establish and maintain procedures for assessing risks
 - 4.1 Risks presented by identified hazards are correctly assessed in accordance with WHS legislation and codes of practice
 - 4.2 A procedure for ongoing assessment of risks is developed and integrated within systems of work and procedures

- 4.3 Activities are monitored to ensure that this procedure is adopted effectively throughout the area of managerial responsibility
 - 4.4 Risk assessment is addressed at the planning, design and evaluation stages of any change within the area of managerial responsibility to ensure that the risk from hazards is not increased
- 5. Establish and maintain procedures for controlling risks
 - 5.1 Measures to control assessed risks are developed and implemented in accordance with the hierarchy of control, relevant WHS legislation, codes of practice and trends identified from the WHS records system
 - 5.2 When measures that control a risk at its source are not immediately practicable, interim solutions are implemented until a control measure is developed
 - 5.3 A procedure for ongoing control of risks, based on the hierarchy of control, is developed and integrated within general systems of work and procedures
 - 5.4 Activities are monitored to ensure that the risk control procedure is adopted effectively throughout the area of managerial responsibility
 - 5.5 Risk control is addressed at the planning, design and evaluation stages of any change within the area of managerial responsibility to ensure that adequate risk control measures are included
 - 5.6 Inadequacies in existing risk control measures are identified in accordance with the hierarchy of control, and resources enabling implementation of new measures are sought and/or provided according to appropriate procedures
- 6. Establish and maintain organisational procedures for dealing with hazardous events
 - 6.1 Potential hazardous events are correctly identified
 - 6.2 Procedures which would control the risks associated with hazardous events and meet any legislative requirements as a minimum are developed in consultation with appropriate emergency services
 - 6.3 Appropriate information and training is provided to all employees to enable implementation of the correct procedures in all relevant circumstances
- 7. Establish and maintain a
 - 7.1 A WHS training program is developed and implemented

WHS training program	to identify and fulfil employees' WHS training needs as part of the organisation's general training program
8. Establish and maintain a system for WHS records	8.1 A system for keeping WHS records is established and monitored to allow identification of patterns of occupational injury and disease within the area of managerial responsibility
9. Evaluate the organisation's WHS system and related policies, procedures and programs	9.1 The effectiveness of the WHS system and related policies, procedures and programs is assessed according to the organisation's aims with respect to WHS 9.2 Improvements to the WHS system are developed and implemented to ensure more effective achievement of the organisation's aims with respect to WHS 9.3 Compliance with WHS legislation and codes of practice is assessed to ensure that legal WHS standards are maintained as a minimum

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

This competency is to be exhibited in accordance with all relevant WHS legislation, particularly:

- Commonwealth/state/territory WHS Acts, regulations and codes of practice, including regulations and organisational codes of practice relating to hazards present in the workplace
- General duty of care under WHS legislation and common law; requirements for the maintenance and confidentiality of occupational injury and disease
- Requirements for provision of WHS information and training
- Provisions relating to health and safety representatives and/or WHS committees
- Provisions relating to WHS issue resolution
- Civil Aviation Safety Regulations (CASRs), Manuals of

Standards and associated Acceptable Means of Compliance and Guidance Material

- WHS framework includes:**
- Policy development and updating
 - Determining the ways in which WHS functions will be managed. This may include distinct WHS management activities, or inclusion of WHS functions within a range of management functions and operations, such as maintenance of plant and equipment; purchasing of materials and equipment
 - Designing operations, work flow and materials handling; planning or implementing alterations to site, plant, operations or work systems; mechanisms for review and allocation of human, technical and financial resources needed to manage WHS, including defining and allocating WHS responsibilities for all relevant positions
 - Mechanisms for keeping up to date with relevant information and updating the management arrangements for WHS, for example, information on health effects of hazards, technical developments in risk control and environmental monitoring and changes to legislation
 - Mechanisms to assess and update WHS arrangements relevant to legislative requirements; a system for communicating WHS information to employees, supervisors and managers within the enterprise
- Appropriate consultative processes for management of WHS include:**
- WHS committees and other committees, for example, consultative, planning and purchasing
 - Health and safety representatives; employee and supervisor involvement in WHS management activities, for example, WHS inspections, audits, environmental monitoring, risk assessment and risk control
 - Procedures for reporting hazards, risks and WHS issues by managers and employees
 - Inclusion of WHS in consultative or other meetings and processes
- Procedures for identifying**
- Workplace inspections, including plant and equipment;

hazards include:

audits

- Maintaining and analysing WHS records, including environmental monitoring and health surveillance reports
- Maintenance of plant and equipment
- Reviews of materials and equipment purchases, including manufacturers and suppliers information
- Employee reporting of WHS issues

Procedures for assessing risks include:

- Determining the likelihood and severity of adverse consequences from hazards
- WHS audits; workplace inspections; maintenance of plant and equipment; purchasing of materials and equipment
- Planning or implementing alterations to site, operations or work systems
- Analysis of relevant records and reports, for example, injuries and incidents, hazardous substances inventories/registers, audit and environmental monitoring reports and WHS committee records

Procedures for controlling risks include:

- Assessing the WHS consequences of materials, plant or equipment prior to purchase
- Obtaining expert advice; appropriate application of measures according to the hierarchy of control, namely: elimination of the risk
- Engineering controls
- Administrative controls
- Personal protective equipment (PPE)
- Designing safe operations and systems of work; inclusion of new WHS information into procedures
- Checking enterprise compliance with regulatory requirements

Organisational procedures for hazardous events include:

- Making inventories of, and inspecting, high risk operations
- Inspecting systems and operations associated with potentially hazardous events, for example, emergency communications, links to emergency services, firefighting, chemical spill containment, bomb alerts and first aid services

A WHS training program includes:

- Arrangements for ongoing assessment of training needs, for example, relating to supervisors and managers
- Specific hazards; specific tasks or equipment
- Emergencies and evacuations
- Training required under WHS legislation
- Allocation of resources for WHS training, including acquisition of training resources, development of staff training skills and purchase of training services
- Induction training; training for new operations, materials

- or equipment
- WHS records include:**
- Identifying records required under WHS legislation, for example, worker's compensation and rehabilitation records
 - Hazardous substances registers; material safety data sheets (MSDS)
 - Major accident/injury notifications
 - Certificates or licences
 - Manufacturers and suppliers WHS information
 - WHS audits and inspection reports
 - Maintenance and testing reports
 - Workplace environmental monitoring and health surveillance records
 - Records of instruction and training
 - First aid/medical post records
- Assessment of the effectiveness of the WHS system and related policies, procedures and programs includes:**
- Reviewing the effectiveness of the WHS management system
 - Regular review of operating procedures
 - Regular analysis of WHS records
 - Audits against WHS legislative requirements

Unit Mapping Information

Release 1 – equivalent to MEA134B Establish, maintain and evaluate the organisation's occupational health and safety system

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA134 Establish, maintain and evaluate the organisation's work health and safety system

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- ability to analyse working environment and design appropriate WHS management systems
- ability to analyse relevant data and evaluate WHS system effectiveness
- ability to assess resources to establish and maintain WHS management systems.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- provisions of relevant WHS legislation
- principles and practice of effective WHS management
- management arrangements relating to regulatory compliance
- enterprise hazards and risks, control measures and relevant expertise required
- characteristics and composition of workforce and their impact on WHS management
- relevance of enterprise management systems to WHS management.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations in establishing, maintaining and evaluating a WHS system
- The candidate must have access to all equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.

- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA135 Use computers in aviation maintenance-related integrated logistic support activities

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the use of the internet, word processing, spreadsheets, databases and project planning software to perform tasks relating to integrated logistic support (ILS) activities associated with aviation maintenance, including aircraft technical records and compliance with regulatory requirements relating to the compilation and safeguarding of data during scheduled or unscheduled maintenance.

The unit is part of the Aeroskills Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Integrated logistic support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | |
|---------------------------------|-----|---|
| 1. Use word processing software | 1.1 | Correspondence is drafted using word processing software |
| | 1.2 | Reports, including tables, are drafted using word processing software |
| | 1.3 | Instructions are drafted and amended using word processing software |
| 2. Use spreadsheets | 2.1 | Spreadsheets used within the enterprise are used to obtain |

- data
 - 2.2 Enterprise spreadsheets are updated through data input
 - 2.3 A simple spreadsheet is developed for a typical ILS-related application
 - 3. Use databases
 - 3.1 Databases used for maintenance-related ILS activities within the enterprise are used to obtain data
 - 3.2 Databases are populated with data as required
 - 4. Use project-planning software
 - 4.1 Project-planning software is used to plan a typical maintenance-related ILS task
 - 4.2 Project-planning software is used to monitor the progress of a task
 - 4.3 Data is entered into enterprise maintenance task management software and is used where applicable
 - 5. Use the internet
 - 5.1 Regulatory information is obtained from applicable internet websites
 - 5.2 Technical data is obtained from internet websites
 - 6. Maintain and store backup copies of data
 - 6.1 Required media for backup copies of data is determined
 - 6.2 Backup copies of data are made and are updated as required by regulatory requirements, and organisational policies and procedures
 - 6.3 Backup copies of data are stored in accordance with regulatory requirements, and organisational policies and procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

ILS-related spreadsheet applications include:

- Costing a maintenance task or proposed modification
- Assessing the economic value of a proposed repair
- Costing a training program for maintenance personnel
- Management of items of aeronautical product both on and off aircraft
- Management of life critical parts
- Maintenance programs
- Life cycle costing data

Databases used for maintenance-related ILS activities include:

- Baselines for reliability, availability and maintainability
- Life support analysis record data
- Personnel task authorisations and training records
- Management of items of aeronautical product both on and off aircraft
- Management of life critical parts
- Maintenance programs

Maintenance-related ILS tasks using project planning software include:

- planning an aircraft maintenance task
- planning a modification program
- planning a maintenance personnel training program

Technical data includes:

- Standards
- Specifications
- Vendor data on materials, piece parts and components
- Engineering data

Required media for backup copies of data are specified in:

- Regulations
- Organisational policies and procedures
- Contract requirements

Regulatory requirements, and organisational policies and procedures include:

- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- Aircraft maintenance programs
- Quality manuals
- Procedures manuals
- Work instructions
- AAP 7001.053 Technical Airworthiness Management Manual
- Defence Regulations and instructions
- Standing instructions
- Maintenance management plan

- Applicable overseas airworthiness regulations, such as Federal Aviation Regulations and European Aviation Safety Regulations

Unit Mapping Information

Release 1 – equivalent to MEA135A Use computers in aviation maintenance-related integrated logistic support activities

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA135 Use computers in aviation maintenance-related integrated logistic support activities

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- use of word processing software
- development and use of spreadsheets
- populating and obtaining data from databases
- use of project planning software
- use of the internet to obtain regulatory and technical data.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- types of word processing software commonly used in the maintenance-related ILS environment
- development and use of spreadsheets
- database usage in the maintenance-related ILS environment
- use of project planning software and the types of task management software used by maintenance organisations
- internet websites relating to regulatory requirements, standards and specifications
- use of internet search engines to obtain technical and commercial data
- procedures for backing up and storing data.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations involving the use of computers in maintenance-related ILS activities.
- The candidate must have access to all equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.

- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA136 Assess aviation maintenance spares and manage repairable items

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge required to apply integrated logistic support (ILS) procedures in the assessment of spares and the management of repairable items, including aircraft and mechanical and avionic items of aeronautical product, during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA135 Use computers in aviation maintenance-related integrated logistic support activities

Competency Field

Integrated logistic support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Perform spares assessment activities | 1.1 Enterprise spares assessment and supply information systems are identified and applied |
| | 1.2 Maintenance data, spares usage data and trends are monitored and required holdings of spares are varied as |

- required
- 1.3 Spares availability problems are identified and strategies are determined to resolve the problems
 - 1.4 Where applicable, suitable substitute parts are identified and necessary engineering approvals obtained in accordance with applicable regulations, and organisational policies and procedures
 - 1.5 Acceptable sources of substitute parts are identified and requirements for documentation, such as certification reports and release notes, are specified in accordance with regulatory requirements, and organisational policies and procedures
 - 1.6 Configuration management (CM) requirements are observed in spares assessing
 - 1.7 Data required for input to ILS records is provided where applicable
2. Manage repairable items
- 2.1 Maintenance and reliability data is monitored and changes to maintenance programs are proposed where necessary
 - 2.2 Documentation is raised to allocate repairable items to maintenance facilities in accordance with contractual requirements, and organisational policies and procedures
 - 2.3 Any specific investigation or additional maintenance requirements are specified
 - 2.4 Data required for input to ILS records is provided where applicable

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Spares assessment and supply information systems include:

- Manual or computer-based systems
- Systems developed within the organisation or proprietary systems purchased by the organisation

Suitable substitute parts are identified from:

- Modification data
- Drawings, standards and specifications in the case of piece parts and materials
- Manufacturers catalogues and specifications in the case of complete components (items of aeronautical product)

Applicable regulations, and organisational policies and procedures include:

- Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs)
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- AAP 7001.053 Technical Airworthiness Management Manual
- Organisational policy manuals
- Quality manuals
- Organisational procedures manuals
- Work instructions
- Defence regulations and instructions
- Maintenance management plan
- Standing instructions

ILS records include:

- Logistic support analysis plans
- Life cycle costing data
- Failure modes, effects and criticality analysis
- Baselines for reliability, availability and maintainability
- Life support analysis record data

Repairable items include:

- Removable structural components
- Mechanical components
- Items of role equipment
- Hydraulic, pneumatic and fuel components
- Items of safety equipment
- Fire detection and extinguishing components
- Engines and engine components
- Propellers and rotors
- Electrical system components
- Instrument system components

Investigation or additional maintenance requirements Include:

- Radio system components
- Electronic systems components
- service difficulty (defect) report investigation
- Incident investigation
- Warranty claims
- Modifications
- Compliance with airworthiness directives or special technical instructions
- Service bulletin compliance

Unit Mapping Information

Release 1 – equivalent to MEA136A Assess aviation maintenance spares and manage repairable items

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA136 Assess aviation maintenance spares and manage repairable items

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- using software packages relevant to spares assessing and repairable item management
- oral communication
- written communication
- problem solving
- application of regulatory and procedural requirements
- identification and resolution of problems relating to availability of spares.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- ILS principles relating to spares assessing, repairable item management and CM
- software packages used by the enterprise for spares assessment, supply management and repairable item management
- use of drawings, standards and specifications to identify substitute piece parts and materials
- use of catalogues and specifications to identify substitute components (items of aeronautical product)
- regulations, organisational policies and procedures relating to spares assessment and repairable item management
- work health and safety (WHS) requirements relating to substitute piece parts, materials and components
- fraud and ethics.

Assessment Conditions

- 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 an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered in spares assessment and management of repairable items, especially in relation to component or piece-part substitution.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA137 Write aviation technical publications

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the researching of data, drafting and processing of technical publications and amendments to technical publications, including maintenance manuals, operating instructions, parts catalogues, procedures manuals and related technical publications to support scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA135 Use computers in aviation maintenance-related integrated logistic support activities

Competency Field

Integrated logistic support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|------------------|---|
| 1. Research data | 1.1 The required medium, style and layout are determined |
| | 1.2 Relevant data is obtained or accessed |
| | 1.3 Potential problems are identified and relevant experts are identified and consulted |

- | | | |
|----|--|---|
| | 1.4 | Problem resolution strategies are determined |
| 2. | Draft publication or publication amendment | <p>2.1 The publication or amendment is drafted using relevant guidelines and specified software package</p> <p>2.2 Required graphics are selected and illustrator briefs are raised</p> <p>2.3 Copyright legislation is observed</p> <p>2.4 Completed graphics are inserted into the draft and annotations/labels added</p> <p>2.5 The draft is prepared for publishing and is submitted for editorial review</p> |
| 3. | Process draft publication or amendment | <p>3.1 Proof copy of the publication or amendment is submitted for client acceptance</p> <p>3.2 Publication or amendment is published</p> <p>3.3 The publication management database is updated and the completed publication is delivered or distributed</p> |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

The required medium can be one or more of:

- Print-based
- Electronic
- Microfiche

Style and layout can be determined from one or more of:

- An applicable style guide
- Contract requirements
- Industry standards and specifications

Relevant data sources

- Design and production data and drawings

include:

- Parts and materials listings
- Operating procedure documentation
- Maintenance schedules
- Modification instructions and service bulletins
- Manufacturer's and trade catalogues
- Relevant legislation and regulations

Relevant experts include:

- The client
- Design engineers and staff
- Production staff
- Component and material suppliers
- Regulator representatives

Unit Mapping Information

Release 1 – equivalent to MEA137A Write aviation technical publications

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA137 Write aviation technical publications

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria at least once under the specified conditions of assessment.

Evidence must be provided that the candidate can:

- undertake research
- utilise applicable documentation standards and style manuals
- communicate orally
- produce written communications to the required level
- undertake problem solving
- use word processing software and graphics packages to produce draft technical publications.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- word processing and graphics packages used for technical publication and publication amendment drafting
- publication writing conventions, standards and specifications
- the use of style guides
- illustration techniques
- reading of engineering drawings, including:
 - standard drawing sheets and drawing layouts
 - types of drawing
 - engineering standards and specifications
 - technical terms and abbreviations
 - sectioned views
 - dimensioning
 - tolerancing of dimensions
 - types of fit
 - aircraft standard hardware

- screw threads
- threaded components and washers
- locking devices
- rivets
- special structural fasteners
- spur gears
- welding symbols and geometry tolerancing
- surface texture
- material specifications and metal surface treatment
- reading of electrical and electronic circuits and wiring diagrams
- development of system schematics
- development of block diagrams
- sketching
- use and development of logic charts
- development of fault diagnosis guides
- the preparation of illustrators' briefs
- the preparation of indexes to publication contents
- problem solving methodology
- regulations relating to technical publications
- work health and safety (WHS) legislation
- for print-based publications, procedures for processing drafts through desktop publishing to printing, binding and distribution
- for electronic format publications, the principles for publication database systems and the development of input data
- requirements for, and methods of, maintaining publication records.

Assessment Conditions

- 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, an appropriate simulation must be used where the elements and performance criteria are fully covered across the range of conditions in the simulation scenarios.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- 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.

- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA138 Perform aviation technical publication management activities

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the application of editorial and management knowledge and skills in the production, publication, distribution and amendment of technical publications, including maintenance manuals, operating instructions, parts catalogues, procedures manuals and related technical publications used in scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA137 Write aviation technical publications

Competency Field

Integrated logistic support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Manage the drafting and publication of technical publications

1.1 The required style for technical publications is determined and specified

1.2 Technical publication drafts are edited

- | | | |
|----|---|---|
| 2. | Manage the amendment of technical publications | 2.1 The requirement for publication amendment action is identified |
| | | 2.2 Amendment action is initiated |
| | | 2.3 Draft amendments are edited |
| 3. | Manage the distribution and control of technical publications | 3.1 A publication distribution and amendment status database is established |
| | | 3.2 Publications are managed in accordance with regulatory requirements, and organisational policies and procedures |
| | | 3.3 The operation of the publication distribution and control system is monitored |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Specifying style for technical publication includes:

- Determination of the client's requirements
- Identification of applicable standards and specifications for publications within the industry
- Identification of any applicable regulatory requirements
- Selection of an appropriate publishing system
- Development and issue of a style guide that specifies:
 - writing style
 - layout
 - fonts
 - graphics selection and conventions
 - procedures for dealing with copyright issues
 - requirements for processing of drafts
- Preparation for publication
- Publication user feedback

The requirement for

publication amendment action includes:

- Modifications to systems or components
- Test procedure development or refinement
- Quality system audits
- Service bulletins
- Compliance with regulatory requirements

The editing process includes checking for:

- Compliance with the style guide
- Completeness and ease of understanding
- Appropriate use of graphics
- Observance of applicable regulations and legislation including copyright
- Final draft mark-up for desktop publishing
- Application of version control procedures

Regulatory requirements, and organisational policies and procedures are found in:

- Civil Aviation Regulations (CARs) and associated Advisory Circulars (ACs)
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- Organisational policy manuals
- Procedures manuals
- Quality manuals
- AAP 7001.053 Technical Airworthiness Management Manual
- Defence Regulations and instructions
- Maintenance management plan
- Standing instructions

Unit Mapping Information

Release 1 – equivalent to MEA138B Perform aviation technical publication management activities

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA138 Perform aviation technical publication management activities

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- specifying the style and layout of technical publications
- determining the need for amendment action
- effective control of technical publication distribution
- oral communication
- written communication.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- layout, content, production and use of technical publication style guides
- applicable publication standards and systems, including Air Transport Association (ATA)100 and Australian Air Publications
- copyright legislation
- graphics conventions and techniques
- desktop publishing software systems
- printing methods
- binder systems
- regulations governing the production, amendment, custody and distribution of technical publications
- version control procedures.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations associated with aviation technical publication management, including all elements and performance criteria.

- The candidate must have access to all materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA139 Perform aviation maintenance-related integrated logistic support management activities

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to integrated logistic support (ILS) elements and related data management and analysis tools in the maintenance-related management and support of systems throughout their life of type. This includes support of scheduled and unscheduled maintenance on aircraft, aircraft systems, avionic systems and items of aeronautical product. Work may be performed individually or as part of a team.

The unit is part of Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Integrated logistic support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Maintain logistic support analysis plans | 1.1 Logistic support analysis plans are reviewed in line with trends in system supportability and affordability |
| | 1.2 Revisions are proposed to logistic support analysis (LSA) plans |
| 2. Perform life cycle cost analysis | 2.1 Actual and anticipated costs through to life of type are identified |
| | 2.2 Cost data is analysed |

- | | | | |
|----|--|-----|---|
| 3. | Establish and maintain baselines for reliability, availability and maintainability (RAM) | 3.1 | Data on in-service reliability, availability and maintainability is gathered |
| | | 3.2 | Data is reviewed against established baselines and action is initiated to deal with deviations from the established baselines |
| 4. | Revise LSA record data | 4.1 | LSA parameters are analysed using current data |
| | | 4.2 | Analysis results are entered in the LSA record |
| 5. | Manage data | 5.1 | A technical data management system is developed and managed in accordance with contractual and regulatory requirements |
| | | 5.2 | The relevance of technical data is monitored and amendment action is initiated, where necessary |
| | | 5.3 | Logistic support management information systems are applied and supported |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Life cycle cost analysis includes:

- The systematic identification and analysis of all actual and anticipated costs associated with implementing and sustaining a system throughout its service life

Costs through to life of type arise from:

- Operation
- Engineering support
- Maintenance support
- Supply support
- Facilities costs
- Personnel costs

Data analysis and review includes:

- Using enterprise databases and analysis tools

- Analysis results include:**
- In-service failure mode effects and criticality analysis
 - Corrective maintenance analysis
 - Reliability centred maintenance analysis
 - Maintenance task analysis
 - Repair level analysis
- Regulatory requirements are found in:**
- Civil Aviation Regulations (CARs) or Civil Aviation Safety Regulations (CASRs)
 - AAP 7001.053 Technical Airworthiness Management Manual
- A technical data management system includes:**
- Maintenance of all applicable technical data
 - Retention of original and back-up data in separate locations
 - Storage in a manner that minimises the risk of data loss, theft or destruction
- The relevance of technical data is determined through:**
- Monitoring engineering, maintenance and supply support activities
 - Utilising user feedback

Unit Mapping Information

Release 1 – equivalent to MEA139A Perform aviation maintenance-related integrated logistic support management activities

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA139 Perform aviation maintenance-related integrated logistic support management activities

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- oral communication
- written communication
- populating and extracting data from databases
- task analysis
- applying ILS principles.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- ILS management and support philosophy and practice
- LSA concepts and methods, including:
 - preparation of LSA plans
 - management and conduct of LSA programs
 - supportability analysis
 - task analysis
 - LSA record population
- RAM determination and application, including:
 - baseline determination and application
 - RAM modelling
 - reliability and maintainability apportionment
- data management concepts and methods.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations involving the application of ILS activities covered by the elements, performance criteria and the range of conditions.
- The candidate must have access to all relevant ILS management tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA140 Supervise aviation maintenance teams and perform maintenance quality inspections

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the management and supervision of aviation maintenance teams and the performance of maintenance quality inspections within the Australian Defence Force (ADF) and within contractor organisations maintaining ADF aircraft and items of aeronautical product during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of Diploma and Advanced Diploma training pathways.

Candidates must have been appointed as a Maintenance Quality Inspector (MQI) or Independent Inspector in order to be assessed for this unit of competency.

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-------------------------------|---|
| 1. Plan maintenance for teams | 1.1 Maintenance tasks are identified and interpreted from available maintenance data or schedule in accordance with organisational procedures |
| | 1.2 Workload is organised in order of priority taking into consideration all required maintenance tasks and specified timeframes |
| | 1.3 Required resources are identified and obtained |
| | 1.4 Tools and support equipment are checked for |

- serviceability and currency of calibration, where applicable
2. Implement team maintenance activities
 - 2.1 Maintenance tasks are allocated to team members after consideration of individual experience, qualifications and task authorisations
 - 2.2 Team members are clearly briefed on their responsibility and function in the team
 - 2.3 Team members are correctly authorised to operate the required items of ground support and test equipment
 3. Provide guidance
 - 3.1 Guidance is provided to team members appropriate to the complexity or criticality of the maintenance task and the experience level of the individual
 - 3.2 Guidance is provided in determining the cause of complex faults or faults not covered in maintenance manual fault diagnosis guides
 4. Monitor and certify maintenance quality
 - 4.1 Activities are checked and personnel are guided to ensure that maintenance is performed and certified in accordance with the applicable documentation, policies and procedures
 - 4.2 Check inspections are performed on completed work or work stages and certified in accordance with regulatory requirements, and policies and procedures
 5. Perform human resource management activities at the supervisor level
 - 5.1 Human factors affecting job performance are identified and addressed
 - 5.2 The possibility of maintenance errors is minimised
 - 5.3 Sound teamwork is maintained through an awareness of contributing factors
 - 5.4 Sound employment relations are maintained
 6. Perform workplace training tasks
 - 6.1 On-job training is delivered
 - 6.2 The Supervisor's Verification portion of the Workplace History Sheets (Section 3) of the Log of Industrial Experience and Achievement is completed
 - 6.3 Expert witness verification of competency for Workplace Assessors is provided, when required
 - 6.4 Opportunities for individuals to develop competencies are

provided

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Maintenance tasks include:**
- Scheduled maintenance
 - Unscheduled maintenance
 - Configuration changes
 - Modification incorporation
 - Repair
 - Overhaul
- Maintenance data or schedule includes any or all of:**
- Maintenance records
 - Maintenance manuals
 - Servicing schedules
 - Computer maintenance data systems
 - Service bulletins
 - Special technical instructions
 - Modification orders
 - Repair instructions
 - Observations and feedback from maintenance personnel and aircrew
 - Internal work instructions or management directives
- Required resources include:**
- Personnel in required numbers with applicable experience, qualifications and task authorisation
 - Spares
 - Consumables
 - Tools
 - Special equipment
 - Ground support equipment
 - Personal protective equipment (PPE)
- Ground support and test equipment includes:**
- Power carts
 - Hydraulic rigs

- Pneumatic rigs
- Stands and docking
- Component test stands
- Guidance encompasses:**
 - Damage assessment
 - Assessment of repair cost effectiveness
 - Assessment of replacement options
- Applicable documentation, policies and procedures include:**
 - Operating manuals
 - Maintenance manuals
 - Organisational policy manuals
 - Quality manuals
 - Safety manuals
 - Material safety data sheets (MSDS)
 - Procedures manuals
 - Work instructions
 - Defence instructions and standards
 - Standing instructions
- Regulatory requirements are found in:**
 - AAP 7001.053 Technical Airworthiness Management Manual
 - Commonwealth and state/territory work health and safety (WHS) legislation
- Human factors affecting job performance include:**
 - Individual health and disability
 - Social psychology
 - Time pressure and workload
 - The physical work environment
- Actions to minimise maintenance errors include:**
 - Varying the extent of supervision according to the nature of the task and work conditions
 - Allowance for qualification and experience levels within the team
 - Allowance for human error and "Murphy's Law" ('If something can go wrong, it will')
- Sound employment relations includes:**
 - Relevant sections of industrial awards
 - Content of enterprise agreements
 - Conditions of employment and service that that apply to the particular workplace
- On-job training includes:**
 - The reinforcement of knowledge and skills gained in off-job training and guiding their application to specific on-job maintenance tasks

Unit Mapping Information

Release 1 – equivalent to MEA140A Supervise aviation maintenance teams and perform maintenance quality inspections

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA140 Supervise aviation maintenance teams and perform maintenance quality inspections

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- oral communication
- written communication
- planning
- supervision
- inspection
- advanced troubleshooting
- people management
- on-job training delivery
- application of WHS requirements in the workplace.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- principles of supervision
- high level technical knowledge applicable to the job
- fault diagnosis techniques
- maintenance data and documentation
- regulations, policies and procedures relating to supervision and certification of maintenance
- human factors and guidelines
- employment relations and conditions
- equity, diversity and fraud
- Commonwealth and state/territory WHS legislation
- MSDS
- use of PPE
- confined space entry permits
- avoidance of maintenance errors

- MEA Aeroskills Training Package, including relevant units of competency and training pathways
- the Log of Industrial Experience and Achievement, responsibility for making entries and responsibility for the certification of entries
- the role of supervisors in assisting workplace competency assessors
- techniques for delivery of on-job training.
-

Assessment Conditions

- This unit may be assessed on the job, or a combination of both on and off the job. Where partial assessment occurs off the job 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 as a team leader.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A141 Manage risk in aviation maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the identification of risks and the management of risk in the fields of management of the performance of scheduled and unscheduled maintenance, and in the provision of maintenance support or integrated logistic support (ILS) during maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Identify the criteria for risk management | 1.1 Risk management procedures are identified from the organisation's risk management plan/maintenance organisation exposition |
| | 1.2 Where a risk management plan does not exist, potential risks are identified and documented |
| | 1.3 Criteria for managing the identified risks are determined in accordance with standard risk management procedures and documented as a risk management plan |

- | | | |
|-----|------------------------------------|--|
| | 1.4 | The process for evaluation and review of the risk management plan is identified from the organisation's plan or an evaluation methodology is developed and included in the plan developed in accordance with standard risk management procedures |
| 2. | Manage risk | |
| | 2.1 | Activities are monitored in accordance with the risk management plan |
| | 2.2 | Performance deviations are identified and responses are initiated in accordance with the risk management plan |
| | 2.3 | The effectiveness of risk responses are monitored and reported in accordance with risk management plan procedures |
| 3.1 | Evaluate risk management processes | |
| | 3.1 | Risk management outcomes are reviewed and analysed to assess the effectiveness of the risk management plan |
| | 3.2 | Recommendations on variations to the plan are developed and processed in accordance with organisational policies and procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Risk management plans include:

- Potential risks and their probability of occurrence and degree of severity
- Treatment options in each case
- Responsibility for implementing treatment options and required response times
- Resources required for risk management
- Plan implementation timeframe
- Periodic review timetable
- Internal reporting system

- Potential risks include:**
- Review methodology
 - Human factors, such as fatigue, illness and maintenance errors
 - Work health and safety (WHS) issues resulting in injury or death
 - Regulatory and procedural violations, such as inappropriate use of minimum equipment lists and failure to observe type certification standards
 - Providing maintenance guidance to remotely-located aircrew or maintenance personnel
 - Maintenance difficulties, such as spares shortages and unexpected failures of systems or components
 - Support equipment failure
 - Environmental problems
 - Contractual issues
 - Skill and experience shortfalls
 - Maintenance cost escalation
 - Natural events
- Criteria for managing the identified risks include:**
- Level and degree of acceptability of each identified risk
 - Legal aspects, such as regulatory violations and contractual commitments
 - Cost of managing specific risks versus the cost to the organisation if the risk eventuated
 - Stakeholder perceptions and expectations
- Standard risk management procedures are found in:**
- Organisational risk management policies
 - Websites dealing with risk management
 - Australian and New Zealand Standard AS/NZS 4360 Risk management
 - Civil Aviation Safety Regulation (CASR) Part 145 Manual of Standards
- Evaluation methodology includes:**
- Oversight of day-to-day operations
 - Interviews with personnel in the organisation
 - Physical inspections
 - Incident reports
 - Questionnaires
 - Periodic review of risk treatment procedures and outcomes

Unit Mapping Information

Release 1 – equivalent to MEA141B Manage risk in aviation maintenance

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA141 Manage risk in aviation maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- application of standards and procedures for assessing and evaluating risks
- development of risk treatment processes
- assessment of legal impact of risk occurrence
- evaluation of risk management plan operation
- oral communication
- written communication.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- organisational policies and procedures for risk management
- CASR Part 145 Manual of Standards, in particular Acceptable Means of Compliance and Guidance Material
- maintenance error management programs
- Australian and New Zealand Standard AS/NZS ISO 31000:2009 Risk management
- regulatory impact of risks
- contractual impact of risks
- cost-benefit analysis
- Commonwealth and state/territory WHS and environment protection legislation
- evaluation techniques
- equity, fraud and ethics.

Assessment Conditions

- This unit may be assessed on 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered during risk management.

- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA142 Manage self in the aviation maintenance environment

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to self-management and skills/professional development relating to aviation scheduled and unscheduled maintenance management, including all aspects of aircraft maintenance, aeronautical product maintenance and other related integrated logistic support (ILS) activities. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|----------------|--|
| 1. Manage self | 1.1 Responsibility for own workload is assessed, prioritised and accepted |
| | 1.2 Work is undertaken autonomously to complete tasks/roles in a timely manner and in accordance with organisational and/or legislative and regulatory standards |
| | 1.3 Independence and initiative are demonstrated in identifying and solving problems |
| | 1.4 Initiative is exercised in liaison with colleagues in identifying and analysing alternative approaches to managing workplace issues and problems |

- 1.5 Own performance is evaluated and monitored and confidence is built in own capability, ideas and vision
 - 1.6 Performance feedback from others is used to improve work performance
 - 1.7 Organisational structure, career paths and eligibility criteria are identified
 - 1.8 Awareness is maintained of the effects of fatigue, drugs and alcohol on performance
2. Work effectively with others
 - 2.1 Effective communication is applied when dealing with others through oral communication, including briefings and presentations, and by written communication, including email
 - 2.2 Others are dealt with ethically and principles of diversity applied
 - 2.3 Judgement and discretion are used as is appropriate to the situation
 - 2.4 The trust and confidence of others is developed and maintained at all levels of the organisation
 - 2.5 Others are mentored in specific areas of aviation maintenance and maintenance management and performance feedback is provided
 - 2.6 Advantages, disadvantages and consequences of ideas are identified and considered
 - 2.7 An awareness of the possibility of fraudulent behaviour is maintained
3. Comply with requirements
 - 3.1 Applicable contractual, legislative, regulatory and organisational requirements are complied with
 - 3.2 Work requirements are surveyed and quotes are provided
 - 3.3 Organisation and customer needs are surveyed and assessed
4. Manage work priorities and resources
 - 4.1 Competing demands to achieve objectives and meet requirements for deliverables are prioritised
 - 4.2 Work plans, programs and budgets are prepared, monitored and reviewed

	4.3	Resource use to achieve objectives is planned
	4.4	The nature, extent and impact of any issues or changes relating to work priorities and resource allocation are identified
5. Facilitate and capitalise on change and innovation	5.1	Change is introduced by working closely with others
	5.2	Opportunities for product and service enhancement and options for achieving the desired result are identified
6. Contribute to development of own skills and professional capability	6.1	Units of competency relevant to current employment and career path through managing own skills development are interpreted and applied
	6.2	Problem solving skills are reviewed for further development
	6.3	Own personal knowledge and skills are assessed and learning opportunities are accessed, as required, to fill gaps and enhance skills
	6.4	New ideas and techniques are accepted and time and effort invested in learning new skills
	6.5	Performance feedback is used to identify and develop ways to improve competence

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Tasks/roles include:

- Self-directed application of knowledge and skills in performing tasks related to maintenance management and/or related ILS activities

Organisational and/or legislative and regulatory standards include:

- Equal employment opportunity (EEO) legislation
- Commonwealth and state/territory work health and safety (WHS) legislation

- Civil Aviation Regulations (CARs) and Advisory Circulars (ACs)
- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material
- Maintenance organisation expositions
- Continuing airworthiness management organisation expositions
- Procedures manuals
- Position descriptions
- Quality manuals
- Safety manuals
- Work instructions
- Relevant overseas regulations, such as Federal Aviation Regulations or European Aviation Safety Agency Regulations
- AAP 7001.053 Technical Airworthiness Management Manual
- Defence Regulations and instructions
- Australian Air Publications
- Standing instructions
- Maintenance management plans
- Duty statements
- Man-hours
- Time requirements
- Spares, materials and consumables
- Resources, such as facilities, support equipment and tooling
- Price

Quotations include any or all of:

Unit Mapping Information

Release 1 – equivalent to MEA142B Manage self in the aviation maintenance environment

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA142 Manage self in the aviation maintenance environment

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- oral communication
- written communication
- applying principles of equity and diversity
- managing own work performance
- managing and interfacing with others
- applying legislation, regulations and organisational policies and procedures relevant to role and workplace
- managing own professional development.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS legislation at Commonwealth and state/territory levels
- human factors
- EEO legislation
- privacy legislation
- freedom of information legislation
- equity guidelines
- diversity principles
- detection of fraud
- Australian Qualifications Framework (AQF) and relevant Training Packages
- leadership principles
- management principles and techniques
- regulations, policies, instructions and guidelines relevant to the organisation and role
- problem solving principles
- constant improvement principles and procedures
- change management.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Competency in this unit underpins competency in other aspects of the workplace role of employees with managerial responsibilities in aviation maintenance and related ILS activities. It may be appropriate to assess parts of this unit in conjunction with units relating to the performance of such aspects of the role.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA143 Develop and manage maintenance error management programs

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the development and management of maintenance error management programs aimed at reducing human error rates within aviation maintenance organisations (AMOs). It covers all maintenance activities relating to aircraft and aeronautical product that are performed within the jurisdiction of the Civil Aviation Safety Authority (CASA) during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Advanced Diploma training pathways.

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Develop a maintenance error management program | 1.1 The aims and objectives of the maintenance error management program are clearly stated and the program is structured in accordance with regulatory requirements |
| | 1.2 The maintenance error management program encourages open and blame-free (unless negligent) reporting of maintenance errors |
| | 1.3 Disciplinary boundaries are clearly stated for application in the event of negligence |
| | 1.4 A maintenance error investigation procedure is specified, including compliance, where applicable, with |

- regulatory procedures for the reporting of significant safety issues related to maintenance errors
- 1.5 A strategy and procedure is specified for the development and delivery of staff training programs relating to maintenance error management
 - 1.6 Reference to the maintenance error management program is included in applicable organisational policies and procedures
 - 1.7 Provision is made for feedback of program results to the workforce, and for analysis of accumulated data to identify maintenance error trends
2. Manage a maintenance error management program
- 2.1 Reported events are reviewed to determine if they should be investigated within the procedures of the maintenance error management program
 - 2.2 Significant safety issues related to maintenance errors are reported to CASA and/or the Air Transport Safety Bureau (ATSB)
 - 2.3 Events applicable to the maintenance error management program are investigated in accordance with program procedures
 - 2.4 The results of the investigation are analysed to determine appropriate action to minimise the probability of a recurrence of the event
 - 2.5 Necessary action is taken and feedback is provided to the workforce
 - 2.6 The event and resultant action are reviewed to determine what information, if any, should be forwarded to bodies external to the organisation
 - 2.7 Accumulated data is reviewed in accordance with the program procedures to determine and monitor maintenance error trends

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Regulatory requirements and associated guidelines include:

- Civil Aviation Safety Regulations (CASRs), Manuals of Standards and associated Acceptable Means of Compliance and Guidance Material

Regulatory procedures for the reporting of significant safety issues include:

- Major defect report (MDR)
- Service difficulty report (SDR)
- Confidential aviation incident report (CAIR)

Applicable organisational policies and procedures include:

- Maintenance organisation expositions
- Quality manuals
- Safety manuals
- Procedures manuals
- Work instructions

Unit Mapping Information

Release 1 – equivalent to MEA143B Develop and manage maintenance error management programs

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA143 Develop and manage maintenance error management programs

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- written and oral communication
- use of regulations and advisory material to set up a maintenance error management program
- specification of training requirements
- application of human factors
- application of trend analysis to maintenance data.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant regulations and advisory material
- human factors
- investigative processes
- trend analysis
- how to specify training requirements
- equity, fraud and ethics.

Assessment Conditions

- 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, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations encountered during maintenance error management.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.

- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA145 Conversion from allied trades for employment in aviation maintenance workshops

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of common core skills and knowledge that are aviation maintenance specific and meet the requirements of the two Regulators, the Civil Aviation Safety Authority (CASA) and the Australian Defence Force (ADF). The skills and knowledge will be applied during the maintenance of items of aeronautical product in aviation maintenance workshops.

The unit is applicable to individuals with Certificate III or Certificate IV qualifications in allied trades (primarily automotive, electrotechnology or metals and engineering) who are to be employed in aviation maintenance workshops. It covers aviation maintenance-specific parts of common core competencies that must be applied by all individuals employed on the maintenance of items of aeronautical product and which would not have been covered in allied trade units that relate to similar areas of expertise.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

This unit applies to MEA Skill Sets and must not be included in any AQF qualification.

Pre-requisite Unit

MEA108 Complete aviation maintenance industry documentation

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Identify and access aviation industry manuals, specifications and drawings	1.1 Appropriate manuals are identified and accessed for the type of aircraft or component to be maintained 1.2 Amendment status is clearly established to ensure the correct specifications and procedures are applied
2. Amend manuals, specifications or drawings	2.1 Manual, specification or drawing changes and/or amendments are incorporated and documented correctly in accordance with statutory regulations and/or enterprise procedures
3. Store manuals, specifications or drawings	3.1 Manuals, specifications or drawings are stored appropriately to ensure prevention of damage, ready access and updating of information, when required, in accordance with regulatory and/or enterprise procedures
4. Apply standard trade practices	4.1 Common types of aircraft attachment hardware are correctly selected and used 4.2 Common types of safety locking devices and fasteners are correctly selected and used 4.3 Aircraft components, devices and hardware are lockwired in the correct manner, using the appropriate wire gauge 4.4 Common types of aircraft connectors and plumbing are accurately assembled or connected
5. Interpret and apply quality standards in the aviation maintenance environment	5.1 Standards or specifications set out in maintenance documents and process specifications are identified and interpreted 5.2 Enterprise quality requirements are identified, confirmed and applied
6. Plan steps and organise work to complete task	6.1 Steps are planned in conjunction with the work of other personnel to allow achievement of practical outcomes in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices

- 6.2 Human factors and work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS), are allowed for in planning of steps
- 6.3 Work activity is organised with other involved personnel, allowing for relevant human factors and using relevant communication processes to ensure safe and appropriate sequencing of tasks
- 6.4 All necessary documentation related to job planning and progress is completed and recorded in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

<p>Appropriate manuals include:</p>	<ul style="list-style-type: none"> • Aircraft publications, maintenance instruction manuals, process specifications, servicing or service bulletins or structural repair manuals • Tooling or equipment manuals, manufacturer's manuals, standard practices, enterprise aviation regulations and publications • Illustrated parts catalogues, aircraft wiring manuals or drawings
<p>Application of standard aviation trade practices includes:</p>	<ul style="list-style-type: none"> • The selection and use of hand and power tools and equipment associated with workshop-related activities in the aircraft maintenance environment that involve: <ul style="list-style-type: none"> • laying out and fabricating simple items from common aircraft materials • assembling items using a representative range of common types of aircraft attachment hardware for which relevant fits and clearances, appropriate safety locking devices and fasteners, including lockwire, are correctly selected and applied

	<ul style="list-style-type: none"> • assembling/connecting a range of common aircraft connectors and plumbing, applying safety locking devices, where applicable • assembling/connecting aircraft control cables and applying safety locking devices, where applicable
Regulatory and enterprise procedures are found in:	<ul style="list-style-type: none"> • Civil Aviation Regulations (CARs) or Civil Aviation Safety Regulations (CASRs) • Maintenance organisation manual • Procedures manuals • Work instructions • Quality manuals • Safety manuals • Applicable Defence Regulations and instructions • Standing instructions
Human factors include:	<ul style="list-style-type: none"> • The factors relating to human behaviour and performance in aviation maintenance environments that are defined by either CASA or the ADF
Documentation includes:	<ul style="list-style-type: none"> • Maintenance logs, overhaul test/check sheets, job history sheets, traveller cards, maintenance reports, irregularity reports, serviceable tags or removal tags • MSDS or material record sheets

Unit Mapping Information

Release 1 – equivalent to MEA145A Conversion from allied trades for employment in aviation maintenance workshops

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA145 Conversion from allied trades for employment in aviation maintenance workshops

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- accessing, interpreting and applying information from industry manuals, including paper-based, microfiche or computer-based media, relating to work activities, including determination of manual amendment status, knowledge of manual structures and locating relevant information/instructions for work activity
- amending industry manuals to reflect current/approved amendment status
- identifying and interpreting information from drawings and diagrams in aircraft maintenance manuals, including component scaling, section, assembly, location, drawing applicability and amendment status from the title block
- correct handling and storage of drawings, manuals and industry media, i.e. microfiche and digital formats
- determining correct lubricants for specified applications
- identifying common ferrous and non-ferrous aircraft materials
- identifying common aircraft composite and non-metallic materials (other than wood)
- identifying aircraft hardware by markings, part numbers, size, shape and material
- installing aircraft hardware using standard practices/techniques to ensure safe security and includes:
 - minimum thread engagement
 - split pinning
 - lockwiring
 - application of locking compounds
 - locking tabs and spring washers
 - lock nuts
- installing aircraft hardware using tightening, torquing and tensioning techniques
- identifying various types of aircraft rigid and flexible plumbing and their connectors
- identifying aircraft control cables and related cable system hardware
- applying workplace hazard reporting and identification procedures
- being able to differentiate the elements which constitute the quality system and the ability to identify processes, workplace regulations and ISO 9000 compliant documentation and specifications within the workplace environment

- interpreting information relating to the work activity from a range of industry manuals, industry and enterprise regulations and industry documentation
- considering WHS regulations/precautions specific to the work activity and others working in the vicinity of the planned work activity, particularly with regard to electricity, gases (especially oxygen), oils and chemicals
- using MSDS
- applying human factors in planning maintenance activities.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the types of industry manuals used in aviation maintenance and types of media
- requirements for custody and upkeep of industry manuals
- techniques for obtaining and applying data contained in industry manuals
- types of standard aircraft hardware and methods of identification, including bolts, nuts, washers, pins (cotter and tapered), and fasteners (rivets and camlocs)
- materials from which hardware is manufactured and its applications, including plain, corrosion resistant and temperature/heat resistant
- types of safety locking devices and their application
- common ferrous and non-ferrous aircraft materials, heat treatment and testing
- characteristics and properties of common composite and non-metallic materials (other than wood)
- types of aircraft cable, turnbuckles, end fittings, tensiometers, pulleys and cable system components, and aircraft flexible control systems
- types and characteristics of lubricants
- typical quality systems and their operation in the workplace
- workplace quality documentation, such as quality manuals, procedures manuals, work instructions and worksheets
- the relationship between the quality system and WHS requirements, such as workplace hazard reporting
- the relationship between the quality system and identification systems for aircraft hardware, materials and components
- the impact of human factors on the safe and effective performance of maintenance on aircraft and aircraft components
- MSDS.

Assessment Conditions

- Competency should be assessed in the work environment, or by use of simulated activities, covering the use of publications/maintenance regulations/orders and standards and practices, the application of aviation maintenance specific standard trade practices, and of task planning and quality system application in the aeronautical product maintenance environment.

- This unit must be linked in its assessment and application to those that apply to the actual maintenance of items of aeronautical product. It is essential that all WHS requirements are met and understood.
- The transferability of general manual interpretation and use in accordance with relevant aircraft component publications/maintenance regulations/orders and standards and practices must be clearly established. This includes evidence of underlying knowledge and skills associated with the interpretation and use of manuals to supplement understanding of the structure and regulatory requirements associated with the aircraft maintenance environment for aeronautical product maintenance.
- Evidence of knowledge about how aircraft materials, standard items of hardware and fittings are used in component maintenance and the application of quality systems and work planning must be demonstrated. The ability to apply the skills and knowledge across a variety of applications must also be demonstrated.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance of the unit of competency are being achieved under routine supervision on at least one manual from each of:
 - aircraft publications, maintenance instruction manuals, process specifications, servicing or service bulletins or structural repair manuals
 - tooling or equipment manuals, manufacturer's manuals, standard practices, enterprise aviation regulations and publications
 - illustrated parts catalogues, aircraft wiring manuals or drawings
- and on representative tasks from:
 - laying out and fabricating simple items from common aircraft materials
 - assembling items using a representative range of common types of aircraft attachment hardware for which relevant fits and clearances, appropriate safety locking devices and fasteners, including lockwire, are correctly selected and applied
 - assembling/connecting a range of common aircraft connectors and plumbing, applying safety locking devices, where applicable
 - assembling/connecting aircraft control cables and applying safety locking devices, where applicable.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
-

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA146 Prepare and manage aviation maintenance organisation budgets and financial plans

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of procedures for the development and management of budgets and financial plans required to enable the effective operation of an Aviation Maintenance Organisation (AMO) within the bounds of its exposition and to effectively interface with professional finance advisers and accountants.

Applications include the financial management obligations of Accountable Managers of AMOs operating under the Australian Defence Force (ADF) or the Civil Aviation Safety Authority (CASA) regulatory systems.

The unit is part of the Advanced Diploma training pathways.

Pre-requisite Unit

Competency Field

Aviation maintenance management

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Analyse strategic opportunities and intended maintenance activities | 1.1 Strategic opportunities are expressed in terms of aircraft and aeronautical product maintenance activities |
| | 1.2 All intended maintenance activities are converted into special projects or work programs |
| | 1.3 Financial trends are analysed and interpreted in the context of the organisational strategic objectives |

- 1.4 Financial planning objectives, process timeframes and resources are clearly identified
- 2. Develop revenue, expenditure and capital investment proposals
 - 2.1 Individuals and groups are given responsibility for the development of specific budgets and plans
 - 2.2 Consultation occurs with all relevant groups and individuals throughout the organisation
 - 2.3 Proposals are developed taking account of past experience, present trends and future expectations
 - 2.4 Outcomes of proposals are clearly linked to organisational strategic objectives
 - 2.5 Realistic cost-benefit and Maintenance Organisation Exposition compliance costs are incorporated into all proposals
 - 2.6 Organisational investment target rates are met for capital expenditure proposals
 - 2.7 Performance measures and tactics for monitoring and control processes are identified for each proposal/action and a financial risk management plan is developed
 - 2.8 Proposals comply with the organisation's values, policies, code of conduct, legal and ethical obligations
 - 2.9 Proposals are developed within the agreed timeframes
 - 2.10 Supporting evidence is valid and sufficient to allow proper evaluation of the proposals
- 3. Build agreement for budgets and financial plans
 - 3.1 Negotiation is undertaken with relevant groups and individuals in ways that build commitment to the plans
 - 3.2 Links to the achievement of organisational strategic objectives are identified and agreed
 - 3.3 Outcomes are confirmed in terms of clear, concise objectives and timeframes
 - 3.4 Negotiations lead to a clear agreement of those matters to be incorporated into budgets and plans
 - 3.5 Budgets and plans incorporate the outcomes of negotiations and meet the organisation's approval processes

- 3.6 Delegations, accountabilities and responsibilities are agreed and confirmed in writing
- 3.7 Final budget and plans are clearly documented and a communication plan developed
- 4. Communicate budget and financial plans
 - 4.1 Budget/financial plan communication package is reviewed by finance specialists
 - 4.2 Package is amended/revised where appropriate
 - 4.3 Training activities are undertaken with users of the budget and plans across the organisation
 - 4.4 All data and terms are defined and understood by the users of the plans
 - 4.5 Communication outcomes are tested to ensure clear understanding of objectives, processes and accountabilities
- 5. Monitor and control activities against plans
 - 5.1 Delegations and budget accountabilities are confirmed in writing prior to budget period
 - 5.2 Funds are allocated in accordance with budget objectives and parameters
 - 5.3 Recording systems and documentation meet all audit requirements and legal obligations
 - 5.4 Risk management plans are implemented and contingency plans put in place for all financial plans
 - 5.5 Performance is monitored and variances promptly identified
 - 5.6 Variances are analysed in conjunction with relevant experts to determine cause and effect
 - 5.7 Remedial action is taken swiftly to minimise negative impact and maximise benefits
 - 5.8 Budgets and plans are renegotiated/restructured, where necessary, to optimise organisational performance
- 6. Report outcomes of financial plans
 - 6.1 Records of financial performance are properly maintained within organisational systems
 - 6.2 Financial performance is analysed and reported in a form

and language appropriate to the audience

6.3 Non-financial objectives are reported in the context of overall organisational performance

6.4 Strategies and plans are reviewed and updated to optimise organisational performance

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Legislation, codes and national standards relevant to the workplace include:

- Civil Aviation Safety Regulations (CASRs) and associated Manuals of Standards
- AAP 7001.053 Technical Airworthiness Management Manual
- Award and enterprise agreements and relevant industrial instruments
- Relevant legislation from all levels of government that affects business operation, especially in regard to work health and safety (WHS), environmental and sustainability issues, equal employment opportunity (EEO) and anti-discrimination

Strategic opportunities include:

- Aircraft operators and fleet operators seeking to outsource maintenance
- Aeronautical product maintenance needs
- Changing regulatory requirements for maintenance
- New aircraft types
- Provision of logistic support services
- Opportunity to respond to requests for tender to provide aircraft and/or aeronautical product maintenance
- Opportunity to accept sub-contract maintenance tasks from other maintenance organisations

Budgets and plans include:

- Aircraft maintenance budgets
- Aeronautical product maintenance budgets

- Financial budgets
 - Logistic services sales budgets
 - Regulatory compliance budgets
 - Capital expenditure budgets
 - Cash flow plans
- Relevant groups and individuals include:**
- All personnel within the organisation affected by the budgets and financial plans being developed
- Investment target rates include:**
- The minimum percentage rate of return required by the organisation for a capital investment project to proceed
- Capital expenditure includes:**
- Those components of the budget which, for internal policy reasons, are considered to provide benefits over more than one financial period and are to be evaluated as capital expenditure projects
- Legal and ethical obligations include:**
- Compliance with all relevant statutes, regulations and audit requirements of the organisation, along with the organisation's policies, values and codes of conduct
- Supporting evidence includes:**
- Cost-benefit analyses
 - Risk management plans
 - Market research results
 - Tender details
 - Net present value
 - Interest rate of return
 - Pay pack calculations
- Delegations**
- Delegations refer to the decision-making accountabilities relating to the person's position description and/or other written and verbal delegations
- Accountabilities and responsibilities include:**
- Clarification of who is to be accountable for a decision or action prior to its execution, and identification of groups, individuals and activities for which a person is responsible for managing
- Training activities include:**
- Small group discussions
 - Informal meetings
 - Formal, structured competency-based training
 - Television and video conferencing
 - E-learning
- Delegations and budget accountabilities include:**
- Monitoring expenditure
 - Authorising expenditure within limits
 - Reporting on variances to budget/plan
 - Taking remedial action within budget authority
- Audit requirements include:**
- The internal standards required in the management of budgets and financial plans, approved by external/internal auditors

Risk management includes: • The process of identification of potential negative events and the development of plans to mitigate or minimise the likelihood of the negative event occurring and/or the consequences in the event it does occur

Appropriate non-financial objectives include:

- Environmental
- Sustainability
- Compliance with Maintenance Organisation Exposition (CASA regulatory system)
- Compliance with Maintenance Management Plan (ADF regulatory system)
- Compliance with requirements of the applicable airworthiness regulator
- WHS
- Quality and safety management
- Market share
- Customer service
- Security or any other key result area

Unit Mapping Information

Release 1 – equivalent to MEA146A Prepare and manage aviation maintenance organisation budgets and financial plans

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA146 Prepare and manage aviation maintenance organisation budgets and financial plans

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- analysis and interpretation of relevant financial information
- development of formal estimates of reviews, costs, cash flows and logistic requirements
- communication/consultation to ensure all relevant groups and individuals are advised of what is occurring and are provided with an opportunity for input
- cost and benefit analysis to produce balanced arguments to support financial proposals
- risk management to assess probability and consequences of any potential negative event
- investment analysis to evaluate capital expenditure proposals net present value (NPV), incentive rate of return (IROR), etc)
- negotiating agreement on budgets and financial plans with the relevant managers
- relating to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities
- arranging and delivering training to ensure team members and other managers understand the budget/financial planning objectives and processes
- analysing and interpreting positive and negative variances from budget/plan, determining the reasons therefore, and identifying potential actions to remediate the situation
- developing and implementing systems to ensure financial performance records are collected, maintained and properly reported.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant legislation from all levels of government that affects business operation, especially in regard to WHS and environmental issues, equal employment opportunity (EEO), industrial relations and anti-discrimination
- requirements in Civil Aviation Safety Regulations (CASRs) and AAP 7001.053 Technical Airworthiness Management Manual regarding financial status of maintenance organisations
- aircraft and aeronautical product maintenance and maintenance management/certification requirements

- financial planning within the organisation
- budgeting
- organisation's intended aircraft and aeronautical product maintenance activities
- consultative methods and processes
- capital investment evaluation techniques
- performance measurement
- organisation roles in respect to financial delegations, accountabilities and responsibilities
- standards for organisational record keeping and audit requirements.

Assessment Conditions

- 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 encountered during the management of organisational budgets and financial plans.
- The candidate must have access to all materials and documentation required and must be permitted to refer to any relevant workplace procedures, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A147 Perform airworthiness management and maintenance program tasks

Modification History

Release 1 - New unit of competency

Application

This unit of competency deals specifically with skills and knowledge required for employment within Civil Aviation Safety Regulation (CASR) Part 42 Continuing Airworthiness Management Organisations (CAMOs) on airworthiness review and maintenance program approval tasks associated with scheduled and unscheduled maintenance.

Work will typically be performed as a staff member of a CAMO as defined in the Part 42 Manual of Standards and in the associated Acceptable Means of Compliance and Guidance Material.

Pre-requisite Unit

ME A137 Write aviation technical publications

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---------------------------------------|---|
| 1. Perform airworthiness review tasks | 1.1 Level of authorisation to perform airworthiness review tasks is determined |
| | 1.2 Continuing airworthiness records for the aircraft under review are obtained |

- 1.3 Airworthiness status of the aircraft is determined
 - 1.4 The aircraft is surveyed for compliance with regulations and with the aircraft's approved type design
 - 1.5 The completion of any required corrective action is verified
 - 1.6 A record of the review is written in accordance with CAMO procedures
 - 1.7 The airworthiness review certificate is raised and issued in accordance with CAMO procedures, or, where applicable, a notice of decision not to issue an airworthiness review certificate is raised and issued
2. Perform maintenance program approval tasks
- 2.1 Level of authorisation to perform maintenance program approval tasks is determined
 - 2.2 Maintenance programs are developed in accordance with applicable regulations and CAMO procedures
 - 2.3 Variations to approved maintenance programs are developed in accordance with applicable regulations and CAMO procedures
 - 2.4 Maintenance schedules are developed in accordance with CAMO procedures for inclusion in the maintenance program
 - 2.5 A schedule of life-limited parts is developed in accordance with CAMO procedures for each maintenance program
 - 2.6 Maintenance program approval documentation is raised and processed in accordance with regulatory requirements and CAMO procedures
 - 2.7 Maintenance program variation approval documentation is raised and processed in accordance with regulatory requirements and CAMO procedures
 - 2.8 One-off extensions to maintenance task intervals are processed in accordance with CAMO procedures
 - 2.9 Maintenance program approval records are raised and maintained in accordance with CAMO procedures
3. Perform reliability
- 3.1 The requirement for a reliability program is determined

program tasks

- 3.2 The reliability program is developed and written in accordance with CAMO procedures
- 3.3 Responsibilities for reliability program administration are determined and recorded in the program
- 3.4 Reliability data sources are identified and data collection, recording, and analysis procedures and responsibilities are specified in the program details
- 3.5 Performance standards are determined and recorded in the program details along with a process for regular review
- 3.6 Procedures are developed for investigation when performance standards are exceeded and for the implementation and recording of corrective action
- 3.7 Operation of the reliability program is monitored to ensure program effectiveness

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

CAMO authorisations

- CAMO authorisations may be found in the CAMO Exposition

Regulatory requirements, standards and advisory material relating to continuing airworthiness management are found in:

- Civil Aviation Safety Regulations (CASRs)
- CASR Part 42 Manual of Standards
- CASR Part 42 Guidance Material and Acceptable Means of Compliance
- Users Guide CASR Part 42
- CAAP 42M-2(0) Reliability Programs
- FAA AC 20-157 How to prepare Reliability Assessment Plans for Aircraft Systems and Equipment

- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- AC 21-15 (1) Supplemental Type Certificates

Unit Mapping Information

Release 1 – equivalent to MEA147A Perform airworthiness management and maintenance program tasks

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA147 Perform airworthiness management and maintenance program tasks

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- communicating in English both verbally and in writing with CAMO staff, aircraft operators, aircraft type certificate holder and regulatory staff
- writing and applying airworthiness review procedures
- determining aircraft airworthiness status and surveying aircraft for compliance with requirements
- raising and processing airworthiness review certificates
- developing and drafting maintenance programs
- revising maintenance programs
- maintaining maintenance program data
- obtaining and maintaining maintenance program approval
- setting up and operating a reliability program.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- continuing airworthiness management regulatory requirements
- the CAMO Exposition and individual appointments and responsibilities
- aircraft design and design approval regulations
- aircraft type certificates and Maintenance Review Boards
- Airworthiness Directives (ADs)
- manufacturer's maintenance data and flight manual
- aircraft weight and balance
- maintenance program development and review procedures
- reliability program design
- data analysis methods and data presentation.

Assessment Conditions

- 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 assessment environment should not disadvantage the candidate.
- Assessors must be satisfied that the candidate can competently and consistently perform all elements and performance criteria of the unit of competency, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
- 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.
- Assessors should gather a range of evidence that is valid, sufficient, current and authentic. The preferred method is the records in the Maintenance Management Competency Log. Where the individual does not have a Competency Log 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.
- This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying scientific principles and techniques in aeronautical engineering situations or other units requiring the exercise of the skills and knowledge covered by this unit.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA148 Apply mathematics and physics in aviation maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of mathematics and physics principles required to support the development and application of aircraft, aircraft system and component maintenance competencies.

It also complies with the requirements of the licensing syllabus in the Civil Aviation Safety Regulation (CASR) Part 66 Manual of Standards.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes

Performance criteria describe the performance needed to demonstrate achievement of the element

- | | | | |
|----|---|-----|---|
| 1. | Apply mathematical techniques in aviation maintenance | 1.1 | Arithmetic is used in calculations relating to aviation maintenance |
| | | 1.2 | Basic algebra is used to solve problems relating to aviation maintenance |
| | | 1.3 | Binary and other applicable numbering systems are used in aviation maintenance applications |
| | | 1.4 | Simple geometric constructions are used in aviation maintenance settings |
| | | 1.5 | Graphical representations are used in aviation maintenance settings |

- | | | | |
|----|---|--|---|
| | 1.6 | Simple trigonometric principles and methods are applied in aviation maintenance settings | |
| 2. | Apply physics laws and principles in aviation maintenance | 2.1 | Statics principles and techniques are applied in aviation maintenance settings |
| | | 2.2 | Kinetics principles and techniques are applied in aviation maintenance settings |
| | | 2.3 | Dynamics principles and techniques are applied in aviation maintenance settings |
| | | 2.4 | Fluid dynamics principles and techniques are applied in aviation maintenance settings |
| | | 2.5 | Thermodynamics principles, laws and techniques are applied in aviation maintenance settings |
| | | 2.6 | Typical applications of light characteristics and laws in aviation maintenance settings are explained |
| | | 2.7 | The application of the principles of wave motion and sound in aviation maintenance settings are explained |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Unit Mapping Information

New unit of competency

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA148 Apply mathematics and physics in aviation maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment on at least one occasion, and must include:

- performing arithmetical calculations typically required in aviation maintenance that apply the methods listed in knowledge evidence
- applying physics principles, laws and techniques listed in knowledge evidence that are applicable to aircraft and aircraft systems.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- arithmetic:
 - terms and signs
 - methods of multiplication and division
 - fractions and decimals
 - factors and multiples
 - weights, measures and conversion factors
 - ratio and proportion
 - averages
 - percentages
 - areas and volumes
 - squares, cubes, square and cube roots
- algebra:
 - how to evaluate simple algebraic expressions (add, subtract, multiply, divide, brackets, and simple fractions)
 - linear equations and their solution
 - indices and powers, negative and fractional indices
 - simultaneous equations and second degree equations with one unknown
- binary and other applicable numbering systems
- logarithms
- geometry:

- simple geometrical constructions
- graphical representation (nature and use, graphs of equations and functions)
- trigonometry:
 - simple trigonometry
 - trigonometrical relationships
 - use of tables
 - rectangular and polar coordinates
- matter:
 - nature of matter (chemical elements, atoms and molecules)
 - chemical compounds
 - states and change between states
- mechanics:
 - forces, moments and couples – representation as vectors
 - centre of gravity
 - elements of theory of stress, strain and elasticity (tension, compression, shear and torsion)
 - nature and properties of solid, fluid and gas
 - pressure and buoyancy in liquids (barometers)
 - linear movement – uniform motion in a straight line, motion under constant acceleration including motion under gravity – Newton’s Laws of Motion
 - rotational motion – uniform circular motion – centrifugal and centripetal forces
 - periodic motion – pendular movement
 - simple theory of vibration, harmonics and resonance
 - velocity ratio, mechanical advantage and efficiency
 - mass
 - force, inertia, work, power, energy (potential, kinetic and total), heat and efficiency
 - momentum and conservation of momentum
 - impulse
 - gyroscopic principles
 - friction – nature and effects and coefficient of friction
 - specific gravity and density
 - viscosity, fluid resistance and effects of streamlining
 - effects of compressibility of fluids
 - static, dynamic and total pressure, Bernoulli’s Theorem and venturi
- thermodynamics:
 - temperature – thermometers and temperature scales (Celsius, Fahrenheit and Kelvin), heat definition
 - heat capacity and specific heat
 - heat transfer – convection, radiation and conduction
 - volumetric expansion

- first and second laws of thermodynamics
- gases – ideal gas laws, specific heat at constant volume and constant pressure, work done by expanding gas
- isothermal, adiabatic expansion and compression, engine cycles, constant volume and constant pressure, refrigerators and heat pumps
- latent heat of fusion and evaporation, thermal energy and heat of combustion
- optics:
 - nature of light and speed of light
 - laws of reflection and refraction – reflection at plane surfaces, reflection by spherical mirrors, refraction and lenses
 - fibre optics
- wave motion and sound:
 - wave motion – mechanical waves, sinusoidal wave motion, interference phenomena and standing waves
 - sound – speed of sound, production of sound, intensity, pitch and quality, and Doppler effect.

Assessment Conditions

- The unit may be assessed off the job in a training classroom environment using problems and application of knowledge relevant to aviation maintenance competencies and relevant knowledge requirements.
- The unit must be linked in its assessment and application to those units that apply to actual maintenance of aircraft.
- Evidence of knowledge about aviation maintenance settings in which mathematical techniques and physics principles, laws and techniques are applied is essential.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and the performance criteria of the unit of competency are being achieved off the job in simulated settings.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA201 Remove and install miscellaneous aircraft electrical hardware/components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills in basic soldering and in crimping associated with the removal and installation of miscellaneous electrical hardware and components fitted to fixed or rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of all Avionic Certificate IV training pathways and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Remove aircraft electrical hardware | 1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety |
| | 1.2 Removal of electrical hardware is carried out in accordance with the applicable maintenance manual observing all relevant work health and safety (WHS) requirements |
| | 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| | 1.4 Removed components are tagged, packaged or discarded in accordance with specified procedures |
| 2. Install aircraft electrical hardware | 2.1 Electrical hardware components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life |
| | 2.2 Physical installation of electrical hardware is carried out in accordance with the applicable maintenance manual |
| | 2.3 System is reinstated to correct physical condition in preparation for testing, as necessary |
| | 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Hardware connection methods include:

- Bolted
- Soldered
- Plug connectors

Types of electrical hardware include:

- Switches, relays, lamps, terminal blocks, current limiters, circuit breakers, fuses, sockets, potentiometers, capacitors, inductors, magnetic amplifiers, transformers, rheostats, resistors and diodes, miscellaneous sensors and minor components hard mounted throughout the aircraft, busbars, lugs, ferrules, splices, connectors and electrical, electronic cables and looms

Basic soldering and crimping

- The work will include the application of basic soldering and crimping skills associated with removal and installation of electrical hardware.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA201B Remove and install miscellaneous aircraft electrical hardware/components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA201 Remove and install miscellaneous aircraft electrical hardware/components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- the preparation and termination of electrical cables to aircraft industry standards, using crimping techniques, soldering techniques and solder sleeves joints
- the correct interpretation of aircraft wire markings, terminal block identification and plug/socket pin numbering systems
- inspection of electrical looms and harness pre and post-removal and installation to ensure minimum bends are maintained, cable is not in tension, plugs are correctly aligned, security of route ensures no chaffing of insulation, adequate clipping and cable ties have been utilised and construction complies with aircraft industry standards
- positive identification of miscellaneous electrical hardware and/or components in all aircraft systems.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- application of relevant WHS practices
- the use of approved maintenance documentation and aircraft publications relating to miscellaneous aircraft electrical hardware and components
- electrical wiring used in aircraft and wire marking
- plug/socket pin numbering and terminal block identification
- cable and loom installation requirements
- crimping tools and crimp terminals
- soldering techniques and the use of solder sleeve joints
- electrical fundamentals.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine maintenance situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- It is essential that applicable cleanliness requirements and WHS safety precautions are fully observed, including awareness of electrostatic discharge procedures.
- Evidence of transferability of skills and knowledge related to removal and installation is essential.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria are being achieved under routine supervision on each of the connection methods:
 - bolted
 - soldered
 - plug connectors.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Implementation Guide).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA202 Remove and install basic aircraft electrical system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of aircraft direct current (DC) electrical system components of fixed and rotary wing aircraft that have only DC electrical systems during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201 Remove and install miscellaneous aircraft electrical hardware/components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Remove DC aircraft electrical system components
 - 1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
 - 1.2 Electrical component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements
 - 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 1.4 Removed components are tagged and packaged in accordance with specified procedures
2. Install DC aircraft electrical system components
 - 2.1 Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
 - 2.2 Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out
 - 2.3 System is reinstated to correct operational condition in preparation for testing, as necessary
 - 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Electrical systems and components include:

- DC generators, and alternator/rectifier generators, and components of related single generator regulation and distribution systems
- Motors
- Actuators
- Piston engine ignition and starting system components
- Aircraft batteries
- Specific components of DC electrical systems, such as flaps and landing gear
- Aircraft lighting
- Gas turbine engine igniter and starting systems

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA202C Remove and install basic aircraft electrical system components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA202 Remove and install basic aircraft electrical system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying/locating:
 - DC power generation, regulation, distribution and control systems and components, i.e. regulators and bus bars
 - piston engine ignition systems and components, i.e. coils, magnetos, auxiliary starting devices (impulse couplings and inductors/vibrators)
 - gas turbine engine igniter and starting system components (where applicable to enterprise)
 - batteries (lead acid and nickel cadmium) and associated mounting equipment, including related anti-vibration aids
 - motors and actuators in basic DC electrical systems
 - specific components of DC electrical systems, such as flaps and landing gear
- correctly connecting DC generators and alternator/rectifier generators
- applying relevant WHS practices.

It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft major electrical system components encompassing electrical with mechanical interface, installations which require alignment and/or adjustment (mechanical or electrical).

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- relevant WHS practices

- the use of approved maintenance documentation and aircraft publications relating to DC electrical systems
- properties of permanent magnets
- precautions for the care and storage of permanent magnets
- general construction, operating characteristics and applications for:
 - aircraft DC generators
 - alternator/rectifier DC generators
 - DC starter/generators
 - DC motors, including starter motors
 - DC rotary and linear actuators
 - batteries
- how to locate and identify components of:
 - DC power regulation and distribution systems
 - piston engine ignition and starting systems
 - gas turbine engine igniter systems, including specific WHS precautions
 - gas turbine engine starting systems
 - DC electrical systems, such as flaps and landing gear retraction
 - lighting systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine maintenance situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware, and the need for adjustment or rigging and system operation as they relate to the work must be demonstrated before undertaking any action.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and the performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) component from each of:
 - DC generators, and alternator/rectifier generators, and components of related single generator regulation and distribution systems
 - motors
 - actuators
 - piston engine ignition and starting system components

- aircraft batteries
- specific components of DC electrical systems, such as flaps, landing gear
- aircraft lighting
- gas turbine engine igniter and starting systems (may be omitted when not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards
- Individuals being assessed who have already attained MEA274 Maintain basic light aircraft electrical systems and components will have satisfied the requirements of this unit with regard to common range of conditions variables. The Log of Industrial Experience and Achievement records relating to MEA274 Maintain basic light aircraft electrical systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA203 Remove and install advanced aircraft electrical system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of advanced aircraft electrical alternating current (AC) and direct current (DC) system components of fixed and rotary wing aircraft that have both AC and DC electrical systems during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway, and of the Mechanical Aircraft Maintenance Engineer licensing pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201 Remove and install miscellaneous aircraft electrical hardware/components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

- | | |
|---|--|
| 1. Remove AC and DC aircraft electrical system components | 1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety |
| | 1.2 Electrical component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| | 1.4 Removed components are tagged and packaged in accordance with specified procedures |
| 2. Install AC and DC aircraft electrical system components. | 2.1 Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life |
| | 2.2 Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out |
| | 2.3 System is reinstated to correct operational condition in preparation for testing, as necessary |
| | 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Electrical system components include:

- DC and AC power generation and distribution system components, including generators and related multi-sourced DC power generation, starter generators alternators and regulation, and control and distribution system components
- Transformer rectifier units and/or inverters
- Batteries and related bus tie or interlock system components and battery temperature monitoring systems
- Motors and actuators
- Components of gas turbine and/or piston engine ignition and starting systems (where applicable to the enterprise)
- External/internal lights
- Electrical components of specific electrical systems, such as air cycle air conditioning, combustion heaters, equipment cooling, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, fire warning and extinguishing, and engine/propeller control (where applicable to the enterprise)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA203C Remove and install advanced aircraft electrical system components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA203 Remove and install advanced aircraft electrical system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- identifying/locating:
 - DC power regulation, distribution and control systems and components, i.e. regulators and bus bars
 - AC power regulation, distribution and control systems and components, i.e. generator control units
 - various types of inverters and transformer rectifier units
 - gas turbine and piston engine ignition and starting systems and components (where applicable to the enterprise)
 - batteries (lead acid and nickel cadmium) and associated mounting equipment including related anti-vibration aids and battery temperature monitoring systems
 - flight control servo actuating devices, i.e. AC and DC electro-mechanical, electro-pneumatic, electro-hydraulic, duplex servomotors, power control units and trim control devices
 - electrical components of aircraft systems, such as air cycle air conditioning, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, external and internal lighting, fire warning and extinguishing, and engine/propeller control (where applicable to the enterprise)
- correctly connecting:
 - DC generators
 - star or delta alternators to star and delta loads
 - starter generators
 - AC motors
 - polyphase motors
- applying relevant WHS practices.

It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft major electrical system components encompassing electrical with mechanical interface and installations that require alignment and/or adjustment (mechanical or electrical).

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- relevant WHS practices
- the use of approved maintenance documentation and aircraft publications relating to AC and DC electrical systems
- properties of permanent magnets
- precautions for the care and storage of permanent magnets
- bonding of aircraft components and lightning protection
- general construction, operating characteristics and applications for aircraft:
 - generators
 - alternators
 - AC and DC motors
 - transformer rectifier units
 - rotary and static inverters
 - batteries
 - linear and rotary actuators
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- environmental protection requirements relating to Halon fire extinguishers (e.g. Bromochlorodifluoromethane (BCF)).

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine maintenance situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware, and the need for adjustment or rigging and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor, that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) component from:
 - DC and AC power generation and distribution system components, including generators and related multi-sourced DC power generation, starter generators alternators and regulation, and control and distribution system components
 - transformer rectifier units and/or inverters
 - batteries and related bus tie or interlock system components and battery temperature monitoring systems
 - motors and actuators
 - components of gas turbine and/or piston engine ignition and starting systems (may be omitted where not applicable to the enterprise)
 - external/internal lights
- and on three (3) components that are applicable to the enterprise from:
 - electrical components of specific electrical systems, such as air cycle air conditioning, combustion heaters, equipment cooling, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, fire warning and extinguishing and engine/propeller control.
- This shall be established via records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA202 Remove and install basic aircraft electrical system components will have covered a significant amount of the skill and knowledge requirements for this unit plus part of the Performance Criteria for Elements 1 and 2 and associated range of conditions items. The Log of Industrial Experience and Achievement records relating to MEA202 Remove and install basic aircraft electrical system components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.
- Guidance information in MEA202 Remove and install basic aircraft electrical system components regarding MEA274 Maintain basic light aircraft electrical systems and components should also be taken into consideration and the attainment of MEA277 Maintain twin engine aircraft electrical systems and components would significantly increase the extent of coverage of range of conditions variables. The Log of Experience and Achievement records relating to MEA274 Maintain basic light aircraft electrical systems and components and MEA277 Maintain twin engine aircraft electrical systems and components may also be accepted as meeting the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA204 Remove and install basic aircraft instrument system components

Modification History

Release 2 - Remote reading gyro compasses and gas turbine engine indication system components added to Range of Conditions

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of basic aircraft instrument system components of fixed and rotary wing aircraft that have basic instrument systems during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201 Remove and install miscellaneous aircraft electrical hardware/components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Remove basic aircraft instrument system components | 1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety |
| | 1.2 Instrument component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| | 1.4 Removed components are tagged and packaged in accordance with specified procedures |
| 2. Install basic aircraft instrument system components | 2.1 Instrument components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life |
| | 2.2 Physical installation of instrument components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out |
| | 2.3 System is reinstated to correct operational condition in preparation for testing, as necessary |
| | 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Instrument components include:

- Pitot/static system components, airspeed indicators (ASIs), vertical speed indicators (VSIs) and counter pointer altimeters
- Directional gyros (DGs) and artificial horizons (AHs), both air and electrically driven
- Turn and bank and slip/turn coordinators
- Direct reading compasses
- Remote reading gyro compasses (where applicable to the enterprise)
- Piston engine indication system components (direct reading measuring instruments and temperature indication)
- Gas turbine engine indication system components (where applicable to the enterprise)
- Outside air temperature gauges (OAT)
- Electrical systems indication (voltage, current, power and frequency)
- Basic fuel quantity indication system components
- Pneumatic/vacuum indication system components
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 2 – Remote reading gyro compasses and gas turbine engine indication system components added to Range of Conditions and Assessment Requirements. No change in outcome

Release 1 – equivalent to MEA204C Remove and install basic aircraft instrument system components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA204 Remove and install basic aircraft instrument system components

Modification History

Release 2 - Remote reading gyro compasses and gas turbine engine indication system components added to Assessment Requirements

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- locating and identifying flight instrument system components comprising:
 - piston engine system temperature, pressure, speed (including mechanical and electrical tachometers), manifold pressure/boost (including aneroid type, syphon bellows and dual compartment type)
 - gas turbine engine indicating system temperature, pressure, speed, torque, fuel flow and vibration (may be omitted if not relevant to the enterprise)
 - auxiliary direct reading systems, including hydraulic pressure, pneumatic pressure and vacuum, and fuel storage quantities
 - flight systems, including attitude, altitude, air speed and OAT
- locating and identifying direct reading compasses
- locating and identifying remote reading gyro compass system components (may be omitted if not relevant to enterprise)
- correct handling and observance of maintenance precautions relating to gyroscopes, gimbals, pitot/static systems (connections, heating and protrusions)
- applying relevant WHS practices.

It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft instrument system components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods

- connection of hardware and plugs
- handling precautions relating to:
 - electrostatic sensitive devices
 - gyroscopes and gimbals
- basic instrument system and component operating principles:
 - atmospheric and barometry
 - terminology and unit of measurement conversion
 - aircraft instrumentation requirements
 - instrument panel layout
 - pressure sensing elements
 - pitot static systems and testing requirements
 - gyroscopic principles
 - direct reading compasses
 - remote reading gyro compasses
 - temperature sensors
 - fluid quantity indication systems
- general layout and components of the following systems:
 - flight systems, including:
 - altitude (direct reading altimeters)
 - attitude, including directional gyros and artificial horizons (both air and electrically driven), turn and slip and turn coordinator
 - airspeed
 - OAT
 - remote reading gyro compass system
 - piston engine indication systems, including:
 - direct reading temperature
 - direct reading pressure (e.g. oil pressure)
 - speed, including mechanical and electric tachometers
 - manifold pressure/boost, including aneroid, syphon bellows and dual compartment types
 - gas turbine engine indication systems, including:
 - temperature and pressure
 - speed, including mechanical and electric tachometers
 - torque
 - fuel flow
 - vibration
 - auxiliary direct reading systems, including:
 - electrical
 - hydraulic pressure
 - pneumatic pressure and vacuum

- basic fuel quantity indication
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine maintenance situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware, and the need for adjustment or calibration and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) component from each of:
 - pitot/static system components, ASIs, VSIs and counter pointer altimeters
 - DGs and AHs, both air and electrically driven
 - turn and bank and slip/turn coordinators
 - remote reading gyro compass system (may be omitted if not relevant to the enterprise)
 - direct reading compasses
 - piston engine indication system components (direct reading measuring instruments and temperature indication)
 - gas turbine engine indication system components (may be omitted if not relevant to the enterprise)
 - electrical systems indication (voltage, current, power and frequency)
 - basic fuel quantity indication system components
 - pneumatic/vacuum indication system components.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

- Individuals being assessed who have already attained MEA275 Maintain basic light aircraft instrument systems and components will have met all of the criteria for this unit. The Log of Industrial Experience and Achievement records relating to MEA275 Maintain basic light aircraft instrument systems and components may be accepted as also meeting the evidence requirements for this unit.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA205 Remove and install advanced aircraft instrument system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of components of advanced instrument systems of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the skills and knowledge required for the removal and installation of general instrument system components in the more advanced types of both fixed and rotary wing aircraft.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201 Remove and install miscellaneous aircraft electrical hardware/components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Remove advanced aircraft instrument system components | 1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety |
| | 1.2 Instrument component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| | 1.4 Removed components are tagged and packaged in accordance with specified procedures |
| 2. Install advanced aircraft instrument system components | 2.1 Instrument components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life |
| | 2.2 Physical installation of instrument components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out |
| | 2.3 System is reinstated to correct operational condition in preparation for testing, as necessary |
| | 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Instrument components include:

- Pitot/static system components, airspeed indicators (ASIs), vertical speed indicators (VSIs), air data system components, machmeters, altimeters including servo and encoding altimeters, outside air temperature gauge (OAT) angle of attack and stall warning/avoidance systems
- Turn and slip, directional gyros (DGs), artificial horizons (AHs), attitude and heading reference system (AHRS) components (where applicable to enterprise), remote reading gyro compass system components and direct reading compasses
- Turbine engine indication systems
- Transmitter/indicator measuring instrument systems (pressure, temperature and position)
- Fuel quantity indication and flow systems components
- Ground proximity warning system (GPWS) (where applicable to the enterprise)
- Flight data recorder (FDR) (where applicable to the enterprise)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA205C Remove and install advanced aircraft instrument system components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA205 Remove and install advanced aircraft instrument system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- locating and identifying flight instrument system components comprising:
 - engine system temperature, pressure (including thermocouples, sensor units and transmitters), speed (including mechanical and electrical tachometers), thrust (fan, propeller and jet), torque, fuel flow and vibration
 - auxiliary systems, including hydraulic pressure and temperature, transmission pressure and temperature, fuel storage quantities, fuel remaining/used, component position, i.e. flaps, landing gear, speed brakes and door/pylon locking
 - flight systems, including attitude, altitude, air speed, OAT and GPWS (where applicable to the enterprise)
- locating and identifying direct reading compasses, remote compass system components (flux valve, gyro, amplifier and indicator), and AHRS components
- locating and identifying FDR system components (where applicable to the enterprise)
- correct handling procedures and maintenance precautions relating to gyroscopes, gimbals, pitot/static systems (connections, heating and protrusions)
- applying relevant WHS practices.

It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft instrument system components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- handling precautions for electrostatic sensitive devices

- relevant WHS practices
- the use of approved maintenance documentation and aircraft publications relating to basic and advanced instrument systems
- basic instrument system and component operating principles:
 - atmospheric and barometry
 - terminology and unit of measurement conversion
 - aircraft instrumentation requirements
 - instrument panel layout
 - pressure sensing elements
 - pitot static systems and testing requirements
 - gyroscopic principles
 - direct reading compasses
 - temperature sensors
 - fluid quantity indication systems
- general layout and components of the following systems:
 - flight systems, including:
 - altitude (direct reading, servo and encoding altimeters)
 - attitude, including DG and AH (both air and electrically driven) and turn and slip, and AHRS
 - airspeed, including ASI, machmeters and air data systems
 - VSI
 - angle of attack and stall warning/avoidance
 - OAT
 - GPWS
 - engine indication systems, including:
 - temperature and pressure, including thermocouples, sensors and transmitters
 - speed, including mechanical and electric tachometers
 - thrust, including fan, propeller and jet
 - torque
 - fuel flow
 - vibration
 - auxiliary transmitter/indicator measuring systems, including:
 - hydraulic pressure and temperature
 - pneumatic pressure
 - transmission oil pressure and temperature
 - fuel remaining/used
 - fuel quantity indication
 - component position
- remote compass systems
- FDR systems

- application of relevant WHS practices.
-

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine maintenance situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware, and the need for adjustment or calibration and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) component from each of:
 - pitot/static system components, ASIs, VSIs, air data system components, machmeters, altimeters, including servo and encoding altimeters, angle of attack and stall warning/avoidance systems
 - turn and slip, DGs, AHs, AHRS components (where applicable to enterprise), remote reading gyro compass system components and direct reading compasses
 - turbine engine indication systems
 - transmitter/indicator measuring instrument systems (pressure, temperature, position)
 - fuel quantity indication and flow systems components
 - GPWS (may be omitted where not applicable to the enterprise)
 - FDR (may be omitted where not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA204 Remove and install basic aircraft instrument system components or MEA275 Maintain basic light aircraft instrument systems and components will have covered a significant amount of the skill and knowledge requirements for this unit plus part of the performance criteria for Elements 1 and 2 and associated range statement items. The Log of Industrial Experience and Achievement records relating to MEA204 Remove and install basic aircraft instrument system components or MEA275 Maintain basic light aircraft instrument systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA206 Remove and install aircraft basic radio communication and navigation system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of basic radio communication and navigation system components of fixed and rotary wing aircraft that have basic radio communication and navigation systems, during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201 Remove and install miscellaneous aircraft electrical hardware/components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

1. Remove basic radio communication and navigation system components

1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety

1.2 Communication and navigation system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements

1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

1.4 Removed components are tagged and packaged in accordance with specified procedures

2. Install basic radio communication and navigation system components

2.1 Communication and navigation system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life

2.2 Physical installation of components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out

2.3 System is reinstated to correct operational condition in preparation for testing, as necessary

2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Communication and navigation system components include:

- High frequency (HF) and very high frequency (VHF) communication and applicable antennas
- Automatic direction finding (ADF) and very high frequency omni-directional range (VOR) navigation and applicable antennas
- Emergency location transmitter (ELT)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA206C Remove and install aircraft basic radio communication and navigation system components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA206 Remove and install aircraft basic radio communication and navigation system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- locating and identifying radio communication and navigation system components comprising:
 - HF and VHF communications
 - VOR and ADF navigation systems
 - ELT systems
- locating and identifying applicable radio system antennas
- removing and installing communication and navigation system components including antennas
- applying relevant WHS practices.

It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of radio communication and navigation system components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- handling precautions for electrostatic sensitive devices
- relevant WHS practices
- the use of approved maintenance documentation and aircraft publications relating to radio communication and navigation systems and components
- basic layout and working principles to block diagram level of:

- HF communication systems
- VHF communication systems
- ADF navigation systems
- VOR navigation systems
- ELT systems
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine maintenance situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware, and the need for adjustment or calibration and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of:
 - HF and VHF communication and applicable antennas
 - ADF and VOR navigation and applicable antennas
 - ELT.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).must satisfy National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) assessor requirements.
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

- Individuals being assessed who have already attained MEA207 Remove and install aircraft electronic system components will have covered a significant amount of the skill and knowledge requirements for this unit plus part of the performance criteria for Elements 1 and 2 and associated range of conditions items. Those who have attained MEA276 Maintain basic light aircraft communication and radio navigation systems and components, or MEA289A Maintain basic light aircraft avionic systems and components, will have fully covered the requirements for this unit in common variables in the Range of Conditions. The Log of Industrial Experience and Achievement records relating to MEA207 Remove and install aircraft electronic system components, MEA276 Maintain basic light aircraft communication and radio navigation systems and components and MEA289A Maintain basic light aircraft avionic systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA207 Remove and install aircraft electronic system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of electronic system components and line replaceable units (LRUs) of fixed and rotary wing aircraft that are fitted with electronic systems, during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201 Remove and install miscellaneous aircraft electrical hardware/components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

1. Remove aircraft electronic system components
 - 1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
 - 1.2 Electronic system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements
 - 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 1.4 Removed components are tagged and packaged in accordance with specified procedures
2. Install aircraft electronic system components
 - 2.1 Electronic system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
 - 2.2 Physical installation of electronic components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out
 - 2.3 System is reinstated to correct operational condition in preparation for testing, as necessary
 - 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Electronic system components include:

- Panel and rack mounted electronic system components and LRUs of:
 - instrument navigation systems
 - communication systems
 - radio navigation systems
 - pulse operated systems
 - antennas
 - electronic instrument displays (where applicable to the enterprise)
 - automatic flight control systems (where applicable to the enterprise)
 - cabin entertainment equipment (where applicable to the enterprise)
 - on-board maintenance systems (where applicable to the enterprise)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA207C Remove and install aircraft electronic system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA207 Remove and install aircraft electronic system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- locating and identifying electronic navigational system components, including altitude reporting systems (transponder, encoder and control unit), remote attitude displays and Inertial Navigation and Reference Systems
- locating and identifying multi-function electronic displays, including electronic flight instrument system (EFIS), engine indicating and crew alerting system (EICAS), electronic central aircraft monitor system (ECAM), flight management computer system (FMCS) and head-up display (HUD)
- locating and identifying radio communication and navigation system components comprising ultra-high frequency (UHF); satellite communications (SATCOM); distance measuring equipment (DME); instrument landing system (ILS); global navigation system (GNS); radio navigation; traffic collision avoidance system (TCAS); radio altimeter (RADALT); and radio system antennas, including half dipole, slotted, loop and marconi
- locating and identifying primary and secondary radar system components, including transmission lines, waveguide and antennas
- locating and identifying cockpit voice recorder system components, internal communications and passenger/cockpit audio/visual components
- applying relevant WHS practices.

It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of components and plugs
- printed circuit boards
- panel and rack mounting systems for electronic system components and LRUs
- relevant WHS practices

- the use of approved maintenance documentation and aircraft publications relating to the avionics systems and components being maintained
- handling and maintenance precautions relating to gyroscopes, gimbals, electronic displays, airborne radar systems (including pressurised waveguides), electrostatic sensitive devices and radio installations
- electromagnetic environment
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware, and the need for adjustment or calibration and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of electronic system components as listed in the range of conditions.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on sufficient components/LRUs of systems (at least five (5) including their antennas) to establish competency, as follows:
 - instrument navigation systems
 - communication systems
 - radio navigation systems
 - pulse operated systems
 - antennas
 - electronic instrument displays (may be omitted where not applicable to the enterprise)
 - automatic flight control systems (may be omitted where not applicable to the enterprise)
 - cabin entertainment equipment (may be omitted where not applicable to the enterprise)
 - on-board maintenance systems (may be omitted where not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA206 Remove and install aircraft basic radio communication and navigation system components will have covered a significant amount of the skill and knowledge requirements for this unit plus part of the performance criteria for Elements 1 and 2 and associated range of conditions items. The Log of Industrial Experience and Achievement records relating to MEA206 Remove and install aircraft basic radio communication and navigation system components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA208 Remove and install aircraft pressurisation control system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of pressurisation control system components of fixed wing aircraft that have pressurisation systems, during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201 Remove and install miscellaneous aircraft electrical hardware/components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

- | | |
|--|--|
| 1. Remove pressurisation control system components | <p>1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety</p> <p>1.2 Pressurisation control system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements</p> <p>1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures</p> <p>1.4 Removed components are tagged and packaged in accordance with specified procedures</p> |
| 2. Install aircraft pressurisation control system components | <p>2.1 Pressurisation control system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life</p> <p>2.2 Physical installation of pressurisation control components is performed in accordance with the applicable maintenance manual</p> <p>2.3 System is reinstated to correct operational condition in preparation for testing, as necessary</p> <p>2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures</p> |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and

- Industry standard procedures specified by manufacturers,

requirements include: regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA208C Remove and install aircraft pressurisation control system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA208 Remove and install aircraft pressurisation control system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the pressurisation control system and components being maintained
- locating and identifying the components of pressurisation control systems
- removing and installing pressurisation control system components.

It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of components and plugs
- relevant WHS practices
- the layout and operation to block diagram level of mechanical and electronic pressurisation control systems
- handling precautions relating to electrostatic sensitive devices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.

- An understanding of the attachment methods, connection of hardware, and the need for confirming correct system operation must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- Evidence of transferability of skills and knowledge related to removal and installation is essential.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of components of a specific aircraft type pressurisation control system.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A209 Remove and install aircraft oxygen system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal and installation of aircraft oxygen system components of fixed or rotary wing aircraft that have oxygen systems, during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Remove oxygen system components | 1.1 Oxygen system is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety |
| | 1.2 Removal of oxygen system components is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| | 1.4 Removed components are tagged, packaged or discarded in accordance with specified procedures |
| 2. Install aircraft oxygen system components | 2.1 Oxygen system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life |
| | 2.2 Oxygen system components to be installed are free from contamination and inspected for damaged flair ends and fittings |
| | 2.3 Component installation is physically carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements |
| | 2.4 System is reinstated to correct physical condition in preparation for testing, as necessary |
| | 2.5 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Oxygen system components include:**
- Oxygen pressure cylinders, valves and gauges
 - Regulators, masks (including other integrated systems), pipes, hoses and fittings
 - Chemical generators (where applicable to the enterprise)
 - Liquid dry breathing oxygen (LDBO) converters (where applicable to the enterprise)
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA209C Remove and install aircraft oxygen system components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA209 Remove and install aircraft oxygen system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying appropriate WHS practices and using approved maintenance documentation and aircraft publications relating to aircraft oxygen systems and components
- demonstrating the procedure to replenish a dry breathing oxygen system, including:
 - correct identification of oxygen ground trolleys
 - maximum charging pressures for low and high pressure systems
 - safety precautions to be adhered to during replenishment
 - correct order of procedural replenishment steps
- demonstrating the procedure to purge a dry breathing oxygen system, including:
 - reasons for the requirement to undertake a purging operation
 - identification of acceptable system purging gases
 - safety precautions to be adhered to during purging
- employing correct techniques when purging oxygen storage cylinders or systems.

It is essential that oxygen system cleanliness requirements and safety precautions applicable to system component handling are fully observed, understood and complied with. These cleanliness requirements extend to all tooling and hardware associated with oxygen system maintenance.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft oxygen system components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS practices relevant to oxygen system maintenance
- component attachment methods
- connection of hardware and couplings
- oxygen system isolation

- the properties of aircraft oxygen and requirements for aircrew/passengers
- the layout of low and high-pressure dry breathing oxygen systems and components
- the methods by which gaseous dry breathing oxygen is stored in both the aircraft and within the workplace environment. Reference to storage trolleys, aircraft cylinders and chemical oxygen cylinders is required
- the methods used to locate, identify and access oxygen system components for removal and installation
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is expected that dedicated tools, test and ground support equipment is used in routine oxygen situations.
- An understanding of the attachment methods, connection hardware, and the need for adjustment or rigging and system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of:
 - oxygen pressure cylinders, valves and gauges
 - regulators, masks (including other integrated systems), pipes, hoses and fittings
 - chemical generators (may be omitted where they are not applicable to the enterprise)
 - LDBO converters (may be omitted where they are not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable test equipment to inspect, test and troubleshoot direct current (DC) aircraft electrical systems and components of fixed and rotary wing aircraft that have only DC electrical systems, during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA202 Remove and install basic aircraft electrical system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Inspect DC aircraft electrical systems and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 DC electrical system is visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 Defects are correctly identified and reported |
| 2. Test/adjust DC aircraft electrical systems | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Electrical system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot DC aircraft electrical systems | 3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required and in accordance with standard enterprise procedures |

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

DC electrical systems/components include:

- DC generators and alternator/rectifier generators, and components of related single generator regulation and distribution systems
- Piston engine ignition and starting system components
- Specific components of DC electrical systems, such as flaps and landing gear, including related motors and actuators
- Gas turbine engine igniter and starting systems and components (where applicable to the enterprise)
- Aircraft lighting
- Aircraft main batteries

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA210C Inspect, test and troubleshoot basic aircraft electrical systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - DC power generation systems, including regulation, distribution and control
 - battery installations
 - piston engine ignition and starting systems and components:
 - magnetos or coils
 - starter motors
 - ignition switches/start switches
 - ignition harnesses
 - low tension wiring
 - spark plugs
 - auxiliary starting devices
 - gas turbine engine ignition and starting systems (where applicable to the enterprise):
 - starter motors and starter/generators
 - high energy ignition units
 - control units
 - switches
 - batteries and associated mounting equipment, including related anti-vibration aids
 - motors and actuators in DC electrical systems
 - internal/external lighting systems, including controls
 - flap systems
 - landing gear systems
- applying logic processes, taking and interpreting electrical measurements, and using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability

- applying relevant WHS practices, including those relating to gas turbine engine high energy ignition units.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the electrical system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft electrical systems and components listed in the Range of Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- DC circuit theory
- electrical system maintenance requirements and troubleshooting procedures
- the basic layout (block diagram level), function and operation of:
 - single generator DC power generation and distribution systems and components, including:
 - DC generators
 - alternator/rectifier generators
 - starter/generators
 - voltage regulators
 - circuit protection devices
 - bus bars
 - piston engine ignition and starting systems and components, including:
 - magnetos or coils
 - starter motors
 - ignition switches/start switches
 - ignition harnesses
 - low tension wiring
 - spark plugs
 - auxiliary starting devices
 - gas turbine igniter and starting systems and components, including specific WHS precautions:
 - starter motors and starter/generators
 - high energy ignition units
 - control units
 - switches
 - landing gear and flap systems and components, including:

- motors
- actuators
- selector switches
- micro switches
- internal and external lighting systems and components
- batteries and associated mounting equipment, including related anti-vibration aids
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on electrical looms, cables and connection hardware, and on each system in the range of conditions and on at least one (1) major component/line replaceable unit (LRU) in each case, as follows:
 - DC generators and alternator/rectifier generators, and components of related single generator regulation and distribution systems
 - piston engine ignition and starting system components
 - specific components of DC electrical systems, such as flaps and landing gear, including related motors and actuators
 - gas turbine engine igniter and starting systems and components (may be omitted if not applicable to the enterprise)
 - aircraft lighting
 - aircraft main batteries (competency may be demonstrated through the performance of a battery check).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA274 Maintain basic light aircraft electrical systems and components will have satisfied the requirements of this unit with regard to common range of conditions variables. The Log of Industrial Experience and Achievement records relating to MEA274 Maintain basic light aircraft electrical systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA211 Inspect, test and troubleshoot advanced aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot advanced aircraft electrical systems and components of fixed and rotary wing aircraft that have advanced electrical systems, during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

- | | |
|--------|---|
| MEA203 | Remove and install advanced aircraft electrical system components |
| MEA246 | Fabricate and/or repair aircraft electrical components or parts |

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Inspect advanced aircraft electrical systems and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 Electrical systems are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 Defects are correctly identified and reported |
| 2. Test/adjust advanced aircraft electrical systems | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Electrical system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot advanced aircraft electrical systems | 3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures |

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Electrical systems and their components include:**
- Direct current (DC) and alternating current (AC) power generation and distribution systems and components, including generators, alternators, starter generators and related control, regulation and distribution system components
 - Transformer rectifier units and inverters
 - Batteries and related bus tie or interlock system components and battery temperature monitoring systems
 - Motors and actuators
 - Components of gas turbine and/or piston engine ignition and starting systems (where applicable to the enterprise)
 - External/internal lights
 - Electrical components specific to systems, such as air cycle air conditioning, combustion heating, equipment cooling, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, fire warning and extinguishing and engine/propeller control
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA211C Inspect, test and troubleshoot advanced aircraft electrical systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA211 Inspect, test and troubleshoot advanced aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - DC and AC power generation systems, including regulation, distribution and control
 - inverters (rotary and static)
 - battery installations, including temperature monitoring systems
 - gas turbine and piston engine ignition and starting systems (where applicable to the enterprise)
 - propeller systems
 - internal/external lighting systems, including controls
 - landing gear systems, including anti-skid
 - flight controls
 - fire warning and extinguishing
 - air cycle air conditioning and combustion heating systems
 - equipment cooling and ventilation
 - fuel storage and distribution
 - master and central warning
- applying logic processes, taking and interpreting electrical measurements, using test equipment and appropriate wiring diagrams and manuals to isolate electrical system malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying WHS requirements applicable to the maintenance of aircraft electrical systems
- using approved maintenance documentation and aircraft publications relating to the electrical systems being maintained.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the electrical system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the basic layout (block diagram level), function and operation of the following systems:
- DC and AC power multi-generator systems, including regulation, distribution and control
- inverters (rotary and static)
- battery installations, including temperature monitoring systems
- gas turbine and piston engine ignition and starting systems
- propeller systems
- internal/external lighting systems, including controls
- landing gear systems, including anti-skid
- flight controls
- fire warning and extinguishing
- air cycle air conditioning and combustion heating systems
- equipment cooling and ventilation
- fuel storage and distribution
- master and central warning
- explaining basic principles/functions, relating to the above systems and associated with:
 - basic DC and AC circuit theory
 - DC generator characteristics
 - alternator characteristics
 - starter generator characteristics
 - DC and AC motors
 - rotary and static inverter operation
- WHS requirements applicable to the maintenance of aircraft electrical systems, including gas turbine engine high energy ignition units
- electrical system maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, and test and ground support equipment would be used where appropriate.

- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least one (1) item from each of:
 - DC and AC power generation and distribution systems and components, including generators, alternators, starter generators and related control, regulation and distribution system components
 - transformer rectifier units and inverters
 - batteries and related bus tie or interlock system components and battery temperature monitoring systems
 - motors and actuators
 - components of gas turbine and/or piston engine ignition and starting systems (may be omitted if not applicable to the enterprise)
 - external/internal lights
 - electrical components specific to systems, such as air cycle air conditioning, combustion heating, equipment cooling, anti-icing and de-icing, landing gear, anti-skid, flight control, master and central warning, fuel storage and distribution, fire warning and extinguishing and engine/propeller control.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components will have covered inspection, testing and troubleshooting of DC power generation and DC systems and components. The Log of Industrial Experience and Achievement records relating to MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.
- Advice in MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components regarding the coverage provided by MEA274 Maintain basic light aircraft electrical systems and components should also be taken into consideration if the individual has attained that unit rather than MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components

Modification History

Release 2 – Remote reading gyro compasses and gas turbine engine indication system added to Range of Conditions

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable test equipment to inspect, test and troubleshoot basic aircraft instrument systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

- | | |
|--------|---|
| MEA204 | Remove and install basic aircraft instrument system components |
| MEA246 | Fabricate and/or repair aircraft electrical components or parts |

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Inspect aircraft basic instrument systems and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 Instrument system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 Defects are correctly identified and reported |
| 2. Test/adjust aircraft basic instrument systems and components | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Instrument system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot aircraft basic instrument systems and components | 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 Instrument system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in |

accordance with standard enterprise procedures

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Instrument systems and components include:

- Pitot/static systems and components, airspeed indicators (ASIs), vertical speed indicators (VSIs), outside air temperature gauges (OAT) and counter-pointer altimeters
- Directional gyros (DGs) and artificial horizons (AHs) (air and electrically driven)
- Turn and bank and slip/turn coordinators
- Direct reading compasses
- Remote reading gyro compass systems (where applicable to the enterprise)
- Piston engine indication system components (direct reading measuring instruments and temperature indication)
- Gas turbine engine indication system components (where applicable to the enterprise)
- Electrical systems indication (voltage, current, power and frequency)
- Basic fuel quantity indication systems and components
- Pneumatic/vacuum indication components
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 2 – remote reading gyro compasses and gas turbine engine indication system added to Range of Conditions and Assessment Requirements. No change in outcome

Release 1 – equivalent to MEA212C Inspect, test and troubleshoot basic aircraft instrument systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components

Modification History

Release 2 – Remote reading gyro compasses and gas turbine engine indication system added to Assessment Requirements

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - flight instruments
 - pitot/static systems
 - direct reading compasses
 - remote reading gyro compass systems (may be omitted if not relevant to the enterprise)
 - piston engine indication systems
 - gas turbine engine indication systems (may be omitted if not relevant to the enterprise)
 - electrical systems indication
 - basic fuel quantity indication systems
 - pneumatic/vacuum indication systems
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to isolate instrument system malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying WHS requirements relevant to instrument system maintenance.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the instrument system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of basic aircraft instrument systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the basic layout (block diagram level), function and operation of:
 - flight systems, including:
 - altitude (direct reading altimeters)
 - attitude including DGs and AHs (both air and electrically driven), turn and slip and turn coordinator
 - airspeed
 - OAT
 - remote reading gyro compass systems
 - piston engine indication systems, including:
 - direct reading temperature
 - direct reading pressure (e.g. oil pressure)
 - speed, including mechanical and electric tachometers
 - manifold pressure/boost, including aneroid, syphon bellows and dual compartment types
 - gas turbine engine indication systems, including:
 - temperature and pressure
 - speed, including mechanical and electric tachometers
 - torque
 - fuel flow
 - vibration
 - auxiliary direct reading systems, including:
 - electrical
 - hydraulic pressure
 - pneumatic pressure and vacuum
 - basic fuel quantity indication
- basic instrument system maintenance and testing requirements, and troubleshooting procedures
- WHS requirements relevant to instrument system maintenance
- the operating principles of the above systems and associated with:
 - atmospheric conditions; properties and effects on aircraft instruments and systems
 - pressure and temperature sensing elements and their use in aircraft instruments
 - gyroscopes and their use in aircraft instrument systems
 - electrical fundamentals
- direct reading compass installations and calibration
- calibration of remote reading gyro compass systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least one (1) major system component/line replaceable unit (LRU) from each of:
 - pitot/static systems and components, ASIs, VSIs, OAT, and counter-pointer altimeters
 - DGs and AHs (air and electrically driven)
 - turn and bank and slip/turn coordinators
 - direct reading compasses
 - remote reading gyro compass system components (may be omitted if not relevant to the organisation)
 - piston engine indication system components (direct reading measuring instruments and temperature indication)
 - gas turbine engine indication system components (may be omitted if not relevant to the organisation)
 - electrical systems indication (voltage, current, power and frequency)
 - basic fuel quantity indication systems and components
 - pneumatic/vacuum indication components.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA275 Maintain basic light aircraft instrument systems and components will have satisfied the requirements of this unit with regard to common range of conditions variables. The Log of Industrial Experience and Achievement records relating to MEA275 Maintain basic light aircraft instrument systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot aircraft advanced instrument systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA205 Remove and install advanced aircraft instrument system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Inspect aircraft advanced instrument systems and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 Instrument system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 Defects are correctly identified and reported |
| 2. Test/adjust aircraft advanced instrument systems and components | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Instrument system is functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot aircraft advanced instrument systems | 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 Instrument system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures |

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Instrument systems and components include:

- Pitot/static system components; airspeed indicators (ASIs); vertical speed indicators (VSIs); air data systems and components; machmeters; altimeters, including servo and encoding altimeters; angle of attack and stall warning/avoidance systems
- Turn and slip indicators, directional gyros (DGs), artificial horizons (AHs), attitude and heading reference systems (AHRS) and components, remote reading gyro compass systems and components and direct reading compasses
- Turbine engine indication systems and components (tachometers, pressure, temperature, engine performance and engine vibration)
- Transmitter/indicator measuring instrument systems (pressure, temperature and position)
- Fuel quantity indication and flow systems and components
- Ground proximity warning system (GPWS) (where applicable to the enterprise)
- Flight data recorders (FDRs) (where applicable to the enterprise)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA213C Inspect, test and troubleshoot advanced aircraft instrument systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - flight instruments
 - pitot/static systems
 - navigation systems – compasses and AHRS
 - GPWS (where applicable to the enterprise)
 - FDRs (where applicable to the enterprise)
 - position indicators, engine/auxiliary system indication systems and system components
- applying logic processes, taking and interpreting system measurements, and using test equipment and appropriate wiring diagrams and manuals to isolate instrument and display system malfunctions in the listed systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the instrument and display systems being maintained.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the instrument system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of advanced aircraft instrument systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware
- instrument system maintenance requirements and testing and troubleshooting procedures
- the basic layout (block diagram level), function and operation of:
 - flight instruments, including:
 - ASIs
 - VSIs
 - air data systems and components
 - machmeters
 - altimeters including servo and encoding altimeters
 - turn and slip indicators
 - AHs
 - DGs
 - angle of attack and stall warning/avoidance systems
 - pitot/static systems
 - navigation systems:
 - direct reading compasses
 - gyro compasses
 - AHRS
 - GPWS
 - turbine engine instruments, including:
 - temperature and pressure, including thermocouples, sensors and transmitters
 - speed, including mechanical and electric tachometers
 - thrust, including fan, propeller and jet
 - torque
 - fuel flow
 - vibration
 - auxiliary transmitter/indicator measuring systems, including:
 - hydraulic pressure and temperature
 - pneumatic pressure
 - transmission oil pressure and temperature
 - fuel remaining/used
 - fuel quantity indication
 - component position (e.g. doors, flaps, speed brakes and landing gear)
 - FDR systems
- explaining the operating principles of the above-listed systems and associated with:

- atmospheric conditions; properties and effects on aircraft instruments and systems
- pressure and temperature sensing elements and their use in aircraft instruments
- gyroscopes and their use in aircraft instrument and reference systems
- explaining the various methods of navigation, and describing how they are used by both aircraft conventional and electronic navigational instruments and systems
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least (1) one major system component/line replacement unit (LRU) from each of:
 - pitot/static system components; ASIs; VSIs; air data systems and components; machmeters; altimeters, including servo and encoding altimeters; angle of attack and stall warning/avoidance systems
 - turn and slip indicators, DGs, AHs, AHRS and components, remote reading gyro compass systems and components, and direct reading compasses
 - turbine engine indication systems and components (tachometers, pressure, temperature, engine performance and engine vibration)
 - transmitter/indicator measuring instrument systems (pressure, temperature and position)
 - fuel quantity indication and flow systems and components
 - GPWS (may be omitted if not applicable to the enterprise)
 - FDRs (may be omitted if not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

- Individuals being assessed who have already attained MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components will have covered inspection, testing and troubleshooting of a range of flight instruments and direct reading compass and measuring systems. The Log of Industrial Experience and Achievement records relating to MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.
- Advice provided in MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components regarding MEA275 Maintain basic light aircraft systems and components should also be considered where applicable.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA214 Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot basic communication and radio navigation systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA206 Remove and install basic radio communication and navigation system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Inspect basic communication and radio navigation systems and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 Communication and radio navigation systems and components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 Defects are correctly identified and reported |
| 2. Test/adjust basic communication and radio navigation systems and components | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Communication and radio navigation systems are functionally tested, in accordance with maintenance manual, for evidence of serviceability or malfunction |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot basic communication and radio navigation systems | 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist |

with the troubleshooting process

- 3.4 Communication and radio navigation system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard operating procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Communication and radio navigation systems and components include:

- High frequency (HF), very high frequency (VHF)
- Automatic direction finding (ADF), very high frequency omni-directional range (VOR)
- Emergency location transmitter (ELT)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA214C Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA214 Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the radio frequency and communications system being maintained
- recognising system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in:
 - HF and VHF communications systems
 - VOR and ADF navigation systems
 - ELT systems
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the above systems
- testing listed systems to isolate system faults and assess post maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the communication or radio navigation system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of basic aircraft communication and radio navigation systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:

- HF and VHF communications systems
- VOR and ADF navigation systems
- ELT systems
- communication and radio frequency navigation system maintenance requirements and troubleshooting procedures
- relevant WHS practices
- basic principles/functions, relating to the above systems and associated with:
 - electromagnetic radiation and propagation
 - basic AC and DC circuit theory
 - printed circuit boards
 - digital fundamentals
 - analogue fundamentals
 - transmitter and receiver principles
 - antenna characteristics
 - transmission line characteristics
 - fibre optic communications
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least one (1) major system component/line replaceable unit (LRU) from each of:
 - HF and VHF communications systems
 - ADF and VOR navigation systems
 - ELT systems.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have attained MEA276 Maintain basic aircraft communication and radio navigation systems and components or MEA289 Maintain basic aircraft communication and radio navigation systems and components will have partially met the skill and knowledge requirements and elements/performance criteria for this unit. The Log of Industrial Experience and Achievement records relating to MEA276 Maintain basic aircraft communication and radio navigation systems and components and MEA289 Maintain basic aircraft communication and radio navigation systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA215 Inspect, test and troubleshoot advanced aircraft communications systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot advanced communication systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

This unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

- | | |
|--------|---|
| MEA206 | Remove and install basic radio communication and navigation system components |
| MEA246 | Manufacture and/or repair aircraft electrical components or parts |

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Inspect advanced communications systems and components	1.1 Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements
	1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.3 Communications system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements
	1.4 Defects are correctly identified and reported
2. Test/adjust advanced communications systems and components	2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2 Communications system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
	2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot advanced communications systems	3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 Communications system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Communications systems and components include:

- Ultra-high frequency (UHF) and satellite communications (SATCOM)
- Intercommunication and cockpit voice recorder (CVR) systems

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA215C Inspect, test and troubleshoot advanced aircraft communications systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA215 Inspect, test and troubleshoot advanced aircraft communications systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using approved maintenance documentation and aircraft publications relating to the communications system being maintained
- recognition of system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in:
 - external communications systems (UHF and SATCOM)
 - internal communications systems (intercommunication and CVR)
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the above systems
- testing listed systems to isolate system faults and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the communications system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of advanced communication systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:
 - external communications systems (UHF and SATCOM)
 - internal communications systems (intercommunication and cockpit voice recorders)
- maintenance requirements for the above systems and troubleshooting procedures

- relevant WHS practices
- basic principles/functions, relating to the above-listed systems and associated with:
 - electromagnetic radiation and propagation
 - basic AC and DC circuit theory
 - printed circuit boards
 - digital fundamentals
 - analogue fundamentals
 - transmitter and receiver principles
 - antenna characteristics
 - transmission line characteristics
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least one (1) major system component/line replaceable unit (LRU) from each of:
 - UHF and SATCOM
 - intercommunication and CVR systems.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

- Individuals being assessed who have already attained MEA214 Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components will have already covered a considerable amount of the skill and knowledge requirements for this unit and will have demonstrated capability in a number of tasks that also relate to the performance criteria for Elements 1, 2 and 3. The Log of Industrial Experience and Achievement records relating to MEA214 Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components may be accepted as also meeting some of the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA216 Inspect, test and troubleshoot instrument landing systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot instrument landing systems (ILS) and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA206	Remove and install basic radio communication and navigation system components
MEA207	Remove and install aircraft electronic system components
MEA246	Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-----------------------------------|---|
| 1. Inspect ILS and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 ILS components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 Defects are correctly identified and reported |
| 2. Test/adjust ILS and components | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 ILS is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot ILS | 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 ILS faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures |

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA216C Inspect, test and troubleshoot instrument landing systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA216 Inspect, test and troubleshoot instrument landing systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the ILS being maintained
- recognition of system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in ILS
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the system
- performing system testing to isolate system faults and assess post maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the ILS being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of ILS systems and components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of the system
- integration with other avionic systems
- the location and operation of ground:
 - marker beacons
 - localiser transmitter
 - glideslope transmitter

- ILS maintenance requirements and troubleshooting procedures
- relevant WHS practices
- basic principles/functions relating to the system and associated with:
 - electromagnetic radiation and propagation
 - basic alternating current (AC) and direct current (DC) circuit theory
 - digital fundamentals
 - analogue fundamentals
 - transmitter and receiver principles
 - antenna characteristics
 - transmission line characteristics
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on an ILS system and at least one (1) major system component/line replaceable unit (LRU). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA217 Inspect, test and troubleshoot fixed wing autopilot systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot fixed wing multi-axis autopilot systems and components of fixed wing aircraft that have multi-axis autopilot systems, including those incorporating a radio-coupled flight director, during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA207 Remove and install aircraft electronic system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Inspect fixed wing autopilot systems and components	<p>1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements</p> <p>1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual</p> <p>1.3 Autopilot systems and components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements</p> <p>1.4 Defects are correctly identified and reported</p>
2. Test/adjust fixed wing autopilot systems and components	<p>2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation</p> <p>2.2 Autopilot systems are functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction</p> <p>2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate</p>
3. Troubleshoot fixed wing autopilot systems	<p>3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination</p> <p>3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level</p> <p>3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process</p> <p>3.4 Autopilot system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures</p>

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Autopilot systems and components include:

- Three axis autopilot systems and components, including those incorporating a radio-coupled flight director

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA217C Inspect, test and troubleshoot fixed wing autopilot systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA217 Inspect, test and troubleshoot fixed wing autopilot systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the autopilot and flight director system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - flight director components and interface
 - multi-axis autopilot system components
- applying logic processes, taking and interpreting system measurements, use test equipment and appropriate wiring diagrams and manuals, to accurately and effectively isolate malfunctions in the above systems
- testing listed systems to isolate system malfunctions and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the autopilot system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across an autopilot system and its components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:
 - flight director components and interface

- multi-axis autopilot system components
- integration with other avionic systems, e.g. flight management systems and navigation systems
- flight director and autopilot system maintenance requirements and troubleshooting procedures
- relevant WHS practices
- basic principles/functions, relating to the listed systems and associated with:
 - basic alternating current (AC) and direct current (DC) circuit theory
 - digital fundamentals
 - analogue fundamentals
 - fixed wing flight theory
 - inner and outer loop control
 - flight control modes/channels
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on an autopilot system and its components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA218 Inspect, test and troubleshoot rotary wing autopilot systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot rotary wing autopilot systems and components, including those incorporating a radio-coupled flight director during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA207 Remove and install aircraft electronic system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Inspect rotary wing autopilot systems and components | <p>1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements</p> <p>1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual</p> <p>1.3 Autopilot systems and components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements</p> <p>1.4 Defects are correctly identified and reported</p> |
| 2. Test/adjust rotary wing autopilot systems and components | <p>2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation</p> <p>2.2 Autopilot systems are functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction</p> <p>2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate</p> |
| 3. Troubleshoot rotary wing autopilot systems | <p>3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination</p> <p>3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level</p> <p>3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process</p> <p>3.4 Autopilot system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in</p> |

accordance with standard enterprise procedures

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Autopilot systems and components include:

- Rotary wing aircraft autopilot systems, including those incorporating a radio-coupled flight director

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA218C Inspect, test and troubleshoot rotary wing autopilot systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA218 Inspect, test and troubleshoot rotary wing autopilot systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the autopilot and flight director systems being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - flight director components and interface
 - autopilot system components
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals, to accurately and effectively isolate malfunctions in the listed systems
- testing to isolate system malfunctions and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the autopilot system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across an autopilot system and its components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:
 - flight director components and interface
 - autopilot system components

- integration with other avionic systems, e.g. flight management systems and navigation systems
- flight director and autopilot system maintenance requirements and troubleshooting procedures
- relevant WHS practices
- basic principles/functions, relating to the above-listed systems and associated with:
 - basic alternating current (AC) and direct current (DC) circuit theory
 - digital fundamentals
 - analogue fundamentals
 - rotary wing flight theory
 - inner and outer loop control
 - flight control modes/channels
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on an autopilot system and its components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA219 Inspect, test and troubleshoot aircraft pressurisation control systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot fixed wing aircraft pressurisation control systems and components during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

This unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway, and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA208 Remove and install pressurisation control system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Inspect pressurisation control systems and components	<p>1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements</p> <p>1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual</p> <p>1.3 Pressurisation control systems and components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements</p> <p>1.4 Defects are correctly identified and reported</p>
2. Test/adjust pressurisation control systems and components	<p>2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation</p> <p>2.2 Pressurisation control systems are functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction</p> <p>2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate</p>
3. Troubleshoot pressurisation control systems	<p>3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination</p> <p>3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level</p> <p>3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process</p> <p>3.4 Pressurisation control system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where</p>

required, in accordance with standard enterprise procedures

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Pressurisation control systems include:

- Cabin altimeters
 - Differential pressure indicators
 - Cabin rate of climb indicators
 - Pressure controllers (manual and automatic)
 - Safety switches
- Procedures and requirements include:
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA219C Inspect, test and troubleshoot aircraft pressurisation control systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA219 Inspect, test and troubleshoot aircraft pressurisation control systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the pressurisation control system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - cabin altimeters, differential pressure indicators and cabin rate of climb indicators
 - pressure controllers (manual and automatic)
 - safety switches
- applying logic processes, taking and interpreting system measurements, and using test equipment and appropriate wiring diagrams and manuals to accurately and effectively isolate malfunctions in the listed system components
- assisting with the performance of pressurisation system testing to isolate system malfunctions and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the pressurisation control system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a pressurisation control system and its components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of the listed components and their operation and function within the aircraft pressurisation system, including applicable interface with the outflow and safety valves:
 - cabin altimeters
 - differential pressure indicators
 - cabin rate of climb indicators
 - pressure controllers (manual and automatic)
 - safety switches
- basic principles/functions, relating to the listed system components and associated with:
 - basic alternating current (AC) and direct current (DC) circuit theory
 - digital fundamentals
 - analogue fundamentals
 - atmospheric conditions, properties and effect on humans
 - pressurisation terminology
- pressurisation control system maintenance requirements and troubleshooting procedures
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a pressurisation control system and its components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA220 Inspect, test and troubleshoot aircraft primary radar systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot primary radar systems and components of fixed and rotary wing aircraft that have primary radar systems, such as weather radar during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA207 Remove and install aircraft electronic system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Inspect primary radar systems and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 Primary radar system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 Defects are correctly identified and reported |
| 2. Test/adjust primary radar systems and components | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Primary radar system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction while observing the applicable WHS requirements associated with system ground testing |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot primary radar systems | 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 Primary radar system faults are located and the causes of the faults are clearly identified and correctly recorded in |

maintenance documentation, where required, in accordance with standard enterprise procedures

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA220C Inspect, test and troubleshoot aircraft primary radar systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA220 Inspect, test and troubleshoot aircraft primary radar systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the primary radar system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses/transmission lines/wave guides) and security in radar (navigation/weather) system components and interface
- applying logic processes, taking and interpreting system measurements, to accurately and effectively isolate malfunctions within the system and system components
- performing system testing to isolate system malfunctions and assess system's post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the radar system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a primary radar system and its components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of primary radar systems
- basic principles/functions relating to the system components and associated with:
 - basic alternating current (AC) and direct current (DC) circuit theory
 - digital fundamentals

- analogue fundamentals
- radar fundamentals
- transmission lines, waveguide and antenna characteristics
- primary radar system maintenance requirements and troubleshooting procedures
- relevant WHS practices including those relating to ground functional testing of radar systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a primary radar system and at least one (1) major system component/line replacement unit (LRU). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot secondary radar systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA207 Remove and install aircraft electronic system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Inspect secondary radar systems and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 Secondary radar system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 Defects are correctly identified and reported |
| 2. Test/adjust secondary radar systems and components | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Secondary radar system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction while observing WHS requirements relating to ground testing |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot secondary radar systems | 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 Secondary radar system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required |

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Secondary radar systems include:

- Air traffic control (ATC) transponder
- Radio altimeter
- Distance measuring equipment (DME)
- Doppler navigation system
- Airborne collision avoidance system (ACAS)
- Automatic dependent surveillance-broadcast (ADS-B)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA221C Inspect, test and troubleshoot aircraft secondary radar systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the pulse system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses/transmission lines) and security in:
 - DME components and interface
 - radio altimeters
 - ATC transponders
 - doppler navigation system
 - ACAS
 - ADS-B
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the systems
- testing systems to isolate system malfunctions and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the electrical system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across secondary radar systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods

- the basic layout (block diagram level), function and operation of:
 - DME, including components and interface
 - radio altimeters
 - ATC transponders
 - doppler navigation system
 - ACAS
 - ADS-B
- basic principles/functions, relating to the listed systems and associated with:
 - basic alternating current (AC) and direct current (DC) circuit theory
 - digital fundamentals
 - analogue fundamentals
 - radar fundamentals
 - transmission lines, waveguide and antenna characteristics
- pulse system maintenance requirements and troubleshooting procedures
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) of the following secondary radar systems and its major system components/line replaceable units (LRU):
 - ATC transponder
 - radio altimeter
 - DME
 - doppler navigation system
 - ACAS
 - ADS-B.

- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
-

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA222 Inspect, test and troubleshoot aircraft oxygen systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot aircraft oxygen systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic (Aircraft Maintenance Stream) training pathways and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA209 Remove and install aircraft oxygen system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

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|-------------------------------------|---|
| essential outcomes. | demonstrate achievement of the element. |
| 1. Inspect oxygen system components | <ul style="list-style-type: none"> 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual 1.3 Oxygen system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements 1.4 Defects are correctly identified and reported |
| 2. Test/adjust oxygen systems | <ul style="list-style-type: none"> 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation 2.2 Oxygen system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot oxygen systems | <ul style="list-style-type: none"> 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process 3.4 Oxygen system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required 3.5 Rectification requirements are determined |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Oxygen system components include:**
- Oxygen pressure cylinders, valves and gauges
 - Regulators, masks (including other integrated systems), pipes, hoses and fittings
 - Chemical generators (where applicable to the enterprise)
 - Liquid dry breathing oxygen (LDBO) converters (where applicable to the enterprise)
- Troubleshooting includes:**
- The use of fault-finding charts or similar, to line replacement level
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA222C Inspect, test and troubleshoot aircraft oxygen systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA222 Inspect, test and troubleshoot aircraft oxygen systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- applying appropriate WHS practices
- using approved maintenance documentation and aircraft publications relating to aircraft oxygen systems and components for the purpose of system testing
- general application of logical fault-finding and use of truth tables during troubleshooting
- interpreting oxygen system instruments, gauges, warning annunciators and test equipment, i.e. leak detectors
- applying the methods used to locate, identify and access oxygen system components for inspection, testing and troubleshooting
- demonstrating the procedure to replenish a dry breathing oxygen system, including:
 - correct identification of oxygen ground trolleys
 - maximum charging pressures for low and high pressure systems
 - safety precautions to be adhered to during replenishment
 - correct order of procedural replenishment steps
- demonstrating the procedure to purge a dry breathing oxygen system, including:
 - reasons for the requirement to undertake a purging operation
 - identification of acceptable system purging gases
 - safety precautions to be adhered to during purging
- employing correct techniques when purging oxygen storage cylinders or systems.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the oxygen system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft oxygen systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods, connection of hardware and couplings and their physical security within the aircraft
- oxygen system isolation
- properties of aircraft oxygen and requirements for aircrew/passengers
- properties of the atmosphere and how they vary
- defining terms and units of measurement relating to aircraft altitude and system pressures
- layout of low and high-pressure dry breathing oxygen systems and components
- operation of oxygen systems and components, including:
 - pressure demand regulators
 - passenger service regulators
 - altitude sensing barometers
- methods by which gaseous dry breathing oxygen is stored in both the aircraft and within the workplace environment. Reference to storage trolleys, aircraft cylinders and chemical oxygen cylinders is required
- oxygen system maintenance requirements and troubleshooting procedures
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of:
 - oxygen pressure cylinders, valves and gauges
 - regulators, masks (including other integrated systems), pipes, hoses and fittings
 - chemical generators (may be omitted if not applicable to the enterprise)
 - LDBO converters (may be omitted if not applicable to the enterprise).

- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA223 Inspect aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications to inspect aircraft electrical systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

- | | |
|--------|---|
| MEA203 | Remove and install advanced aircraft electrical system components |
| MEA246 | Fabricate and/or repair aircraft electrical components or parts |

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Inspect electrical systems and components | 1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.2 Electrical system components and hardware are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Defects are correctly identified and recorded in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Electrical systems and components include:

- Alternating current (AC) and/or direct current (DC) power generation, regulation and distribution systems
- Battery installations and bus ties/interlocks
- Rotary and static inverters and transformer rectifier (TR) units
- Air cycle air conditioning and pressurisation systems
- Flight and engine control systems
- Ignition and starting systems
- Fire/smoke detection and extinguishing
- Lighting
- Master and caution warning systems
- Equipment and furnishing

- Equipment cooling and ventilation
- Position indicating systems
- Fuel storage and distribution
- Propeller control systems (where applicable to the enterprise)
- Landing gear indication and anti-skid (where applicable to the enterprise)
- Ice and rain protection (where applicable to the enterprise)
- Wastewater (where applicable to the enterprise)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA223D Inspect aircraft electrical systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA223 Inspect aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the avionic system being maintained
- recognition of system and electrical component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
 - AC and DC power generation systems, including regulation, distribution, control and cooling
 - battery installations and inverters
 - flight control and/or electro-hydraulic systems
 - engine ignition, starting, fuel distribution and control systems
 - internal/external lighting systems, including controls
 - doors
 - landing gear systems
 - anti-skid braking systems
 - master caution and warning systems
- auxiliary systems (including ice/rain protection, fire detection, environmental control and pressurisation, waste and water, equipment and furnishings).

It is essential that inspection procedures, cleanliness requirements and safety precautions applicable to the electrical system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection is essential. This is to be demonstrated through application across a range of aircraft electrical systems, components and hardware listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods and connection of hardware
- explaining the basic layout (block diagram level) and operation of:
 - AC and DC power generation systems, including regulation, distribution, control and cooling
 - battery installations and inverters
 - flight control and/or electro-hydraulic systems
 - engine ignition, starting, fuel distribution and control systems
 - internal/external lighting systems, including controls
 - doors
 - landing gear systems
 - anti-skid braking systems
 - master caution and warning systems
 - auxiliary systems (including ice/rain protection, fire detection, environmental control and pressurisation, waste and water, equipment and furnishings)
- WHS requirements applicable to the maintenance of aircraft electrical systems, including gas turbine engine high-energy ignition units
- electrical system maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and related components in the following groups:
 - AC and/or DC power generation, regulation and distribution systems
 - battery installations and bus ties/interlocks
 - rotary and static inverters and TR units
 - air cycle air conditioning and pressurisation systems
 - flight and engine control systems
 - ignition and starting systems
 - fire/smoke detection and extinguishing

- lighting
- master and caution warning systems
- equipment and furnishing
- equipment cooling and ventilation
- position indicating systems
- fuel storage and distribution
- propeller control systems (may be omitted if not applicable to the enterprise)
- landing gear indication and antiskid (may be omitted if not applicable to the enterprise)
- ice and rain protection (may be omitted if not applicable to the enterprise)
- wastewater (may be omitted if not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA211 Inspect, test and troubleshoot advanced aircraft electrical systems and components, will have covered a significant proportion of the Performance Criteria for Element 1 and will have covered many of the Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to MEA211 Inspect, test and troubleshoot advanced aircraft electrical systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.
- The relationship between MEA211 Inspect, test and troubleshoot advanced aircraft electrical systems and components and MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components may also be taken into account where MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components, has been attained, but not MEA211 Inspect, test and troubleshoot advanced aircraft electrical systems and components. Advice in MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components regarding the coverage of MEA274 Maintain basic light aircraft electrical systems and components, may also be taken into consideration where applicable.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA224 Inspect aircraft instrument systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications to inspect aircraft instrument systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

- | | |
|--------|---|
| MEA205 | Remove and install advanced aircraft general instrument system components |
| MEA246 | Fabricate and/or repair aircraft electrical components or parts |

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Inspect instrument systems and components | 1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.2 Instrument system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Defects are correctly identified and recorded in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Instrument systems and components include:

- Flight instruments, including pitot/static systems, airspeed indicators (ASIs), vertical speed indicators (VSIs), altimeters, altitude alerting and reporting, turn and bank and slip/turn coordinators, directional gyros (DGs) and artificial horizons (AHs) (air and electrically driven)
- Machmeters, air data systems, angle of attack, stall warning and avoidance systems
- Flight data recorders (FDRs)
- Engine indication systems
- Magnetic compasses and attitude and heading reference system (AHRS)
- Miscellaneous instrument systems, including pressure

- measurement, fuel quantity, fuel flow, position indication, voltage and frequency, current and power
- Procedures and requirements include:**
- Ground proximity warning system (GPWS)
 - Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA224C Inspect aircraft instrument systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA224 Inspect aircraft instrument systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

- Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:
- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the instrument system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
 - pitot/static systems and associated instruments and systems
 - flight instruments
 - GPWS and FDR
 - stall warning, angle of attack and stall avoidance systems
 - navigation systems (compasses and AHRS)
- pressure measurement, position indicators, engine/auxiliary system indication systems, including fuel quantity and flow.

It is essential that inspection procedures, cleanliness requirements and safety precautions applicable to the instrument system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection is essential. This is to be demonstrated through application across a range of aircraft instrument systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware
- instrument system maintenance requirements
- the basic layout (block diagram level), function and operation of:

- flight instruments, including:
 - ASIs
 - VSIs
 - air data systems and components
 - machmeters
 - altimeters, including servo and encoding altimeters
 - turn and slip indicators
 - AHs
 - DGs
 - angle of attack and stall warning/avoidance systems
- pitot/static systems
- navigation systems:
 - direct reading compasses
 - gyro compasses
 - AHRS
- GPWS
- turbine engine instruments, including:
 - temperature and pressure, including thermocouples, sensors and transmitters
 - speed, including mechanical and electric tachometers
 - thrust, including fan, propeller and jet
 - torque
 - fuel flow
 - vibration
- auxiliary transmitter/indicator measuring systems, including:
 - hydraulic pressure and temperature
 - pneumatic pressure
 - transmission oil pressure and temperature
 - fuel remaining/used
 - fuel quantity indication
 - component position (e.g. doors, flaps, speed brakes and landing gear)
- FDR systems
- relevant WHS practices
- instrument system maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least (1) one major system component/line replacement unit (LRU) from each of the following groups:
 - flight instruments, including pitot/static systems, ASIs, VSIs, altimeters, altitude alerting and reporting, turn and bank and slip/turn coordinators, DGs and AHs (air and electrically driven)
 - machmeters, air data systems, angle of attack, stall warning and avoidance systems
 - FDRs
 - engine indication systems
 - magnetic compasses and AHRS
 - miscellaneous instrument systems, including pressure measurement, fuel quantity, fuel flow, position indication, voltage and frequency, current and power
 - GPWS.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components, will have covered a significant proportion of the Performance Criteria for Element 1 and will have covered many of the Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.
- The relationship between MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components, and MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components may also be taken into account where MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components has been attained, but not MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and components. Advice in MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components regarding the coverage of MEA275 Maintain basic light aircraft instrument systems and components, may also be taken into consideration where applicable.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A225 Inspect fixed wing aircraft automatic flight control systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications to inspect aircraft automatic flight control systems and components of fixed wing aircraft that have automatic flight control systems during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

ME A207 Remove and install aircraft electronic system components

ME A246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Inspect automatic flight control systems and components | 1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.2 Automatic flight control system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Defects are correctly identified and recorded in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Automatic flight control systems and components include:

- Automatic pilots and associated integrated systems and components, including:
 - automatic pilot
 - flight director
 - automatic trim
 - yaw damper
 - automatic throttle and automatic landing (where applicable to the enterprise)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA225C Inspect fixed wing aircraft automatic flight control systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA225 Inspect fixed wing aircraft automatic flight control systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the automatic flight control system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in automatic flight control system and components.

It is essential that inspection procedures, cleanliness requirements and safety precautions applicable to the electrical system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection is essential. This is to be demonstrated through application across a range of aircraft automatic flight control systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- the basic layout (block diagram level), and operation of the system, including the interface with:
 - flight management systems
 - navigation systems
 - flight control actuators
 - engine management systems
- relevant WHS practices
- maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - automatic pilot
 - flight director
 - automatic trim
 - yaw damper
 - automatic throttle and automatic landing (may be omitted where it is not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
-

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA226 Inspect aircraft electronic systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications to inspect aircraft electronic systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA207 Remove and install aircraft electronic system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

- | | |
|--|---|
| 1. Inspect electronic systems and components | 1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.2 Electronic system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Defects are correctly identified and recorded in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Electronic systems and components include:

- Electronic instrument displays – electronic flight instrument system (EFIS), engine indicating and crew alerting system (EICAS), flight management computer system (FMCS), electronic central aircraft monitor system (ECAM) and head-up display (HUD) (where applicable to the enterprise)
- Instrument navigation systems – inertial navigation system (INS), inertial reference system (IRS), compasses and attitude and heading reference system (AHRS)
- Communication systems – high frequency (HF), very high frequency (VHF), ultra-high frequency (UHF), satellite communications (SATCOM), intercom, data and cabin network services, emergency location transmitter (ELT) and cockpit voice recorder (CVR)
- Radio navigation systems – automatic direction finding (ADF), very high frequency omni-range (VOR), instrument landing system (ILS) and global navigation systems (GNS)
- Pulse operated systems – weather radar, navigation radar,

air traffic control (ATC) transponder, automatic dependent surveillance-broadcast (ADS-B), radio altimeter (RADALT), distance measuring equipment (DME), doppler and airborne collision avoidance system (ACAS) (where applicable to the enterprise)

- Integrated modular avionics (where applicable to the enterprise)
- Information systems – air traffic and information management, network servers (where applicable to the enterprise)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – developed from and MEA226D Inspect aircraft electronic systems and components but not equivalent

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA226 Inspect aircraft electronic systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the avionic system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
 - multi-function display systems (interface units, display generators and display units), i.e. HUD, EICAS, FMS, ACARS, EFIS and ECAM
 - integrated modular avionics (where applicable to the enterprise)
 - INS and IRS
 - external communications systems:
 - HF
 - UHF
 - VHF
 - SATCOM
 - ELT
 - internal communications systems:
 - intercommunication
 - cabin intercommunication data systems
 - cabin network services
 - CVR
 - information systems, such as air traffic and information management systems, and network server systems (where applicable to the enterprise)
 - RF navigation systems:
 - ILS
 - VOR
 - ADF
 - GNS
 - pulse systems that are applicable to the enterprise, including:

- primary radar (navigation/weather) components and interface
- ACAS components and interface
- radio altimeter components and interface
- DME components and interface
- ATC transponders
- ADS-B

It is essential that inspection procedures, cleanliness requirements and safety precautions applicable to the electrical system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection is essential. This is to be demonstrated through application across a range of electronic systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods and connection of hardware
- the basic layout (block diagram level) and operation of:
 - multi-function display systems (interface units, display generators and display units), i.e. HUD, ICAS, FMS, ACARS, EFIS and ECAM
 - integrated modular avionics
 - INS and IRS
 - external communications systems:
 - HF
 - UHF
 - VHF
 - SATCOM
 - ELT
 - internal communications systems:
 - intercommunication
 - cabin intercommunication data systems
 - cabin network services
 - CVR
 - information systems, such as air traffic and information management systems, and network server systems
 - RF navigation systems:
 - ILS

- VOR
- ADF
- GNS
- primary radar (navigation/weather) components and interface
- ACAS components and interface
- radio altimeter components and interface
- DME components and interface
- ATC transponders
- ADS-B.
- relevant WHS practices
- maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on each type of system listed in the following groups and on at least one (1) component for each listed system type:
 - electronic instrument displays – EFIS, EICAS, FMS, ECAM and HUD (where applicable to the enterprise)
 - instrument navigation systems – INS, IRS, compasses and AHRS
 - communication systems – HF, VHF, UHF, SATCOM, intercom, data and cabin network services, ELT and CVR
 - radio navigation systems – ADF, VOR, ILS and GNS
 - pulse operated systems – weather radar, navigation radar, ATC transponder, ADS-B, RADALT, DME, doppler and ACAS (where applicable to the enterprise)
 - integrated modular avionics (where applicable to the enterprise)
 - information systems – air traffic and information management, network servers (where applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) assessor requirements.

- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained any of MEA214 Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components, MEA215 Inspect, test and troubleshoot advanced aircraft communications systems and components, MEA216 Inspect, test and troubleshoot instrument landing systems and components, MEA220 Inspect, test and troubleshoot aircraft primary radar systems and components, and MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components, MEA233 Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components, and MEA234 Inspect, test and troubleshoot aircraft global navigation systems and components, will have covered a significant proportion of the Performance Criteria for Element 1 and will have covered Range of Conditions variables applicable to the unit. The Log of Industrial Experience and Achievement records relating to MEA214 Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components, MEA215 Inspect, test and troubleshoot advanced aircraft communications systems and components, MEA216 Inspect, test and troubleshoot instrument landing systems and components, MEA220 Inspect, test and troubleshoot aircraft primary radar systems and components, MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components, MEA233C Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components, MEA234 Inspect, test and troubleshoot aircraft global navigation systems and components,
- MEA276 Maintain basic aircraft communication and radio navigation systems and components, MEA278 Inspect, test and troubleshoot instrument display systems and components, and MEA289 Maintain basic light aircraft avionic systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA227 Test and troubleshoot aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to test and troubleshoot aircraft electrical systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways and is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA223 Inspect aircraft electrical systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.	demonstrate achievement of the element.
1. Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability
2. Test/adjust electrical systems	2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2 Electrical system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction while observing all relevant work health and safety (WHS) requirements
	2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot electrical systems	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Electrical systems and components include:

- All related electrical hardware, looms and cables
- Alternating current (AC) and/or direct current (DC) power generation, regulation and distribution systems
- Rotary and static inverters and transformer rectifier (TR) units
- Air cycle air conditioning and pressurisation systems
- Flight and engine control systems
- Ignition and starting systems
- Fire/smoke detection and extinguishing
- Lighting (internal and external)
- Master and caution warning systems
- Equipment cooling and ventilation
- Equipment and furnishing
- Position indicating systems
- Fuel storage and distribution
- Landing gear indication and anti-skid
- Main batteries and battery bus ties/interlocks
- Propeller control systems (where applicable to the enterprise)
- Ice and rain protection (where applicable to the enterprise)
- Wastewater (where applicable to the enterprise)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA227D Test and troubleshoot aircraft electrical systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA227 Test and troubleshoot aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the electrical system being maintained
- recognition of system and electrical component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
 - AC and DC power generation systems, including regulation, distribution, control and cooling
 - battery installations
 - flight control and/or electro-hydraulic systems
 - engine ignition, starting, fuel distribution and control systems
 - internal/external lighting systems, including controls
 - landing gear systems
 - anti-skid braking systems
 - auxiliary systems, including ice/rain protection, fire detection, environmental control and pressurisation, water and waste, doors, propeller control, equipment and furnishings
 - equipment cooling and ventilation systems
 - master caution and warning systems
- applying logic processes, taking and interpreting electrical measurements, and using test equipment and appropriate wiring diagrams and manuals to isolate electrical system malfunctions of the above components and systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the electrical system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft electrical systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware
- explaining the basic layout (block diagram level), function and operation of:
 - AC and DC power generation systems, including regulation, distribution, control and cooling
 - battery installations
 - flight control and/or electro-hydraulic systems
 - engine ignition, starting, fuel distribution and control systems
 - internal/external lighting systems, including controls
 - landing gear systems
 - anti-skid braking systems
 - auxiliary systems, including ice/rain protection, fire detection, environmental control and pressurisation, water and waste, doors, propeller control, equipment and furnishings
 - equipment cooling and ventilation systems
 - master caution and warning systems
- explaining basic principles/functions, relating to systems listed above and associated with:
 - basic AC and DC circuit theory
 - digital fundamentals
 - analogue fundamentals
 - AC and DC generator characteristics
 - single and polyphase AC motors and DC motors
 - rotary and static inverters
 - air cycle air conditioning
 - electrical sensing and transmitting devices
- WHS requirements applicable to the maintenance of aircraft electrical systems, including gas turbine engine high-energy ignition units
- electrical system maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least one (1) item from each of the following groups, including all related electrical hardware, looms and cables:
 - AC and/or DC power generation, regulation and distribution systems
 - rotary and static inverters and TR units
 - air cycle air conditioning and pressurisation systems
 - flight and engine control systems
 - ignition and starting systems
 - fire/smoke detection and extinguishing
 - lighting (internal and external)
 - master and caution warning systems
 - equipment cooling and ventilation
 - equipment and furnishing
 - position indicating systems
 - fuel storage and distribution
 - landing gear indication and anti-skid
 - main batteries and battery bus ties/interlocks (including a battery check)
 - propeller control systems (may be omitted if not applicable to the enterprise)
 - ice and rain protection (may be omitted if not applicable to the enterprise)
 - wastewater (may be omitted if not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

- Individuals being assessed who have already attained MEA211 Inspect, test and troubleshoot advanced aircraft electrical systems and components, will have covered a significant proportion of the Performance Criteria for Elements 1, 2 and 3 and will have covered many of the Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to MEA211 Inspect, test and troubleshoot advanced aircraft electrical systems and components, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.
- The relationship between MEA211 Inspect, test and troubleshoot advanced aircraft electrical systems and components, and MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components, may also be taken into account where MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components, has been attained, but not MEA211 Inspect, test and troubleshoot advanced aircraft electrical systems and components. Advice in MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components, regarding the coverage of MEA274 Maintain basic light aircraft electrical systems and components, may also be taken into consideration where applicable.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA228 Test and troubleshoot aircraft instrument systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, standard trade practices and systems knowledge in the testing and troubleshooting of aircraft instrument and display systems and components during both scheduled and unscheduled maintenance on both fixed and rotary wing aircraft. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA224	Inspect aircraft instrument systems and components
MEA226	Inspect aircraft electronic systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.	demonstrate achievement of the element.
1. Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect/service difficulty reports, where relevant, are interpreted to identify an unserviceability
2. Test/adjust instrument and display systems	2.1 The aircraft and systems are correctly prepared in accordance with specified procedures for the application of power and system operation
	2.2 Instrument or display system is functionally tested in accordance with specified procedures for evidence of serviceability or malfunction while observing all relevant work health and safety (WHS) requirements
	2.3 System calibration or adjustments are performed in accordance with specified procedures
3. Troubleshoot instrument and display systems	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 Instrument or display system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Fault rectification requirements are determined to assist in planning the repair or adjustment

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Instrument or display systems include:

- Flight instruments – pitot/static systems, airspeed indicators (ASIs), machmeters, air data systems and instruments, vertical speed indicators (VSIs), altimeters, altitude alerting and reporting, turn and bank, directional gyros (DGs), artificial horizons (AHs), angle of attack, stall warning/avoidance, ground proximity warning system (GPWS) and flight data recorders (FDRs)
- Engine instruments – engine speed, pressure, temperature, performance, vibration and torque
- Instrument navigation systems – inertial navigation system (INS), inertial reference system (IRS), compasses and attitude and heading reference system (AHRS)
- Miscellaneous – pressure, fuel quantity, fuel flow, position, voltage, frequency, current and power
- Display systems – electronic flight instrument system (EFIS), engine indicating and crew alerting system (EICAS), flight management computer system (FMCS), electronic central aircraft monitor system (ECAM) and head-up display (HUD) (where applicable to the enterprise)
- Integrated modular avionics (where applicable to the enterprise)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA228D Test and troubleshoot aircraft instrument systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA228 Test and troubleshoot aircraft instrument systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of instrument and display systems
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) for the systems listed in Range of Conditions
- interpreting the information presented on instrument and display systems
- applying logic processes and using appropriate wiring diagrams and manuals to isolate instrument and display system malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- applying standard procedures
- observing all relevant WHS procedures.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the instrument system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This may be demonstrated through application across a range of aircraft instrument and display systems (where display systems are applicable to the enterprise) listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool and test equipment usage and installation/securing of system components

- the basic layout (block diagram level) of the systems listed in the Range of Conditions
- the operating principles of the systems listed in the Range of Conditions and associated with:
 - the properties and effects of atmospheric conditions on aircraft instruments and systems
 - pressure and temperature sensing elements and their use in aircraft instruments
 - gyroscopes and their use in aircraft instrument and reference systems
 - electrical fundamentals and display screen generation
- the various methods of navigation and how they are used by both conventional and electronic navigational instruments and systems
- maintenance requirements and troubleshooting procedures
- WHS procedures relating to instrument and display systems and components
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including software management control.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that general purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information to enable troubleshooting to line replaceable item level.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on a system and on at least one (1) major system component of each of the following groups:
 - flight instruments – pitot/static systems, ASIs, machmeters, air data systems and instruments, VSIs, altimeters, altitude alerting and reporting, turn and bank, DGs, AHs, angle of attack, stall warning/avoidance, GPWS and FDRs
 - engine Instruments – engine speed, pressure, temperature, performance, vibration and torque
 - instrument navigation systems – INS, IRS, compasses and AHRS
 - miscellaneous – pressure, fuel quantity, fuel flow, position, voltage, frequency, current and power
 - display systems – EFIS, EICAS, FMCS, ECAM and HUD (may be omitted if not applicable to the enterprise)

- integrated modular avionics (may be omitted if not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems, will have covered a significant proportion of the Performance Criteria for Elements 1, 2 and 3 and will have covered many of the Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems, may be accepted as also meeting the evidence requirements for this unit in the applicable areas.
- The relationship between MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems and MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components, may also be taken into account where MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components has been attained, but not MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems. Advice in MEA212 Inspect, test and troubleshoot basic aircraft instrument systems and components regarding the coverage of MEA275 Maintain basic light aircraft instrument systems and components, may also be taken into consideration where applicable.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA229 Test and troubleshoot aircraft radio frequency navigation and communications systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to test and troubleshoot communication and radio frequency (RF) navigation systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA226 Inspect aircraft electronic systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.	demonstrate achievement of the element.
1. Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify an unserviceability
2. Test/adjust RF navigation and communications systems	2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2 RF navigation or communication system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction while observing all relevant work health and safety (WHS) requirements
	2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot RF navigation and communications systems	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 RF navigation or communication system faults are located and the causes are clearly identified and correctly recorded in maintenance documentation, where required
	3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

RF navigation or communication systems include:

- Control and sensing associated with cockpit radio, ground and flight crew communications including frequency modulation (FM) and amplitude modulation (AM) modes of operation in the high frequency (HF), ultra-high frequency (UHF), and very high frequency (VHF) bands, microwave systems and satellite communications (SATCOM)
- Passenger communications, cockpit voice recorder (CVR), audio integration system, cabin intercommunication data systems and cabin network services (where applicable to the enterprise)
- Information systems, such as air traffic and information management systems, and network server systems (where applicable to the enterprise)
- Instrument landing system (ILS), very high frequency omni-range (VOR), automatic direction finding (ADF), global navigation system (GNS), emergency beacons and aircraft communications addressing and reporting system (ACARS)
- Antennae, impedance audio matching devices, microphones and headphones, transmission lines, computer controls, line replaceable units, transmitters/receivers and indicators
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA229D Test and troubleshoot aircraft radio frequency navigation and communications systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA229 Test and troubleshoot aircraft radio frequency navigation and communications systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the RF and communications system being maintained
- recognition of system and component defects/external damage, correct installation, and attaching hardware (including cabling/harnesses/transmission lines) and security in:
 - external communications systems:
 - HF
 - UHF
 - VHF
 - SATCOM and microwave
 - internal communications systems, including:
 - intercommunication
 - cabin intercommunication data systems (where applicable to the enterprise)
 - cabin network services (where applicable to the enterprise)
 - CVR
 - information systems, such as air traffic and information management systems, and network server systems (where applicable to the enterprise)
 - RF navigation systems:
 - ILS
 - VOR
 - ADF
 - GNS
 - ACARS
 - ELT systems
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolating malfunctions within the systems
- performing system testing to isolate system faults and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the aircraft communication and RF navigation system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft communication and RF navigation systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- explaining the basic layout (block diagram level), function and operation of:
 - external communications systems:
 - HF
 - UHF
 - VHF
 - SATCOM and microwave
 - internal communications systems, including:
 - intercommunication
 - cabin intercommunication data systems (where applicable to the enterprise)
 - cabin network services (where applicable to the enterprise)
 - CVR
 - information systems, such as air traffic and information management systems, and network server systems
 - RF navigation systems:
 - ILS
 - VOR
 - ADF
 - GNS
 - ACARS
 - ELT systems
- explaining basic principles/functions relating to the above systems and associated with:
 - electromagnetic radiation and propagation
 - basic AC and DC circuit theory
 - digital fundamentals

- analogue fundamentals
- antenna characteristics
- transmission line characteristics
- WHS requirements
- system and component maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) system and its major components from each of the following groups:
 - control and sensing associated with cockpit radio, ground and flight crew communications including FM and AM modes of operation in the HF, UHF, and VHF bands, microwave systems and SATCOM
 - passenger communications, CVR, audio integration system, cabin intercommunication data systems and cabin network services (may be omitted if not applicable to the enterprise)
 - information systems, such as air traffic and information management systems, and network server systems (may be omitted if not applicable to the enterprise)
 - ILS, VOR, ADF, GNS, emergency beacons and ACARS
- and the following general associated components:
 - antennae, impedance audio matching devices, microphones and headphones, transmission lines, computer controls, line replaceable units, transmitters/receivers and indicators.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

- Individuals being assessed who have already attained any of MEA214 Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components, MEA215 Inspect, test and troubleshoot advanced aircraft communications systems and components, MEA216 Inspect, test and troubleshoot instrument landing systems and components, MEA234 Inspect, test and troubleshoot aircraft global navigation systems and components, MEA276 Maintain basic aircraft communication and radio navigation systems and components and MEA289 Maintain basic light aircraft avionic systems and components, will have covered Element 1 plus a significant proportion of the Performance Criteria for Elements 2 and 3 and will have covered common Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to these units may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA230 Test and troubleshoot fixed wing aircraft automatic flight control systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications to test and troubleshoot aircraft automatic flight control systems and components of fixed wing aircraft that have automatic flight control systems during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways and is an alternative unit to MEA231 Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

- | | |
|--------|---|
| MEA225 | Inspect fixed wing aircraft automatic flight control systems and components |
| MEA246 | Fabricate and/or repair aircraft electrical components or parts |

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Prepare for troubleshooting | 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability |
| 2. Test/adjust automatic flight control system | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
2.2 Automatic flight control system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction while observing all relevant work health and safety (WHS) requirements
2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot automatic flight control system | 3.1 Available information from maintenance documents and inspection and test results is used, where necessary, to assist in fault determination
3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level
3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
3.4 Automatic flight control system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
3.5 Rectification requirements are determined |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Automatic flight control systems include:

- Automatic pilot
- Flight director
- Automatic trim
- Yaw damper
- Automatic throttle and automatic landing (where applicable to the enterprise)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA230C Test and troubleshoot fixed wing aircraft automatic flight control systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA230 Test and troubleshoot fixed wing aircraft automatic flight control systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the automatic flight control system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
 - flight director components and interface
 - flight control components and interface
 - automatic throttle components and interface (where applicable to the enterprise)
 - automatic pilot system and interface
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to accurately and effectively isolate malfunctions in the above systems
- performing system testing to isolate system malfunctions and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the automatic flight control system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft automatic flight control systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- explaining the basic layout (block diagram level), function and operation of:
 - flight director components and interface
 - flight control components and interface
 - automatic throttle components and interface
 - automatic pilot system and interface
 - flight management system interface
 - navigation system interfaces
- explaining basic principles/functions, relating to the above systems and associated with:
 - basic AC and DC circuit theory
 - digital fundamentals
 - analogue fundamentals
 - fixed wing flight theory
 - inner and outer loop control
 - fixed wing flight control system (mechanical, hydraulic and electro-mechanical types, trim and stabilisation)
 - flight control modes/channels
- WHS requirements
- system and component maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one item from each of the following groups:

- automatic pilot
- flight director
- automatic trim
- yaw damper
- automatic throttle and automatic landing (may be omitted where not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA231 Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot rotary wing automatic flight control systems and components of rotary wing aircraft that have automatic flight control systems during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway and is an alternative unit to MEA225 Inspect fixed wing aircraft automatic flight control systems and components and MEA230 Test and troubleshoot fixed wing aircraft automatic flight control systems and components.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA207 Remove and install aircraft electronic system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Inspect automatic flight control system and components	1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
	1.2 Automatic flight control system is visually or physically checked for external signs of defects in accordance with applicable maintenance manual
	1.3 Defects are correctly identified and reported
2. Test/adjust automatic flight control system	2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2 Automatic flight control system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction while observing all relevant work health and safety (WHS) requirements
	2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Prepare for troubleshooting	3.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability
4. Troubleshoot automatic flight control system	4.1 Available information from maintenance documents and inspection and test results is used, where necessary, to assist in fault determination
	4.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level
	4.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	4.4 Automatic flight control system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	4.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Automatic flight control systems include:

- Flight director –indicators, computers, control boxes and interfaces with other systems
- Flight controls –servo actuators (roll, pitch, yaw and trim) computers and sensors
- Autopilot system –computers, sensors (gyros and/or accelerometers), controllers, mode selectors and system interface, control wheel steering (CWS), disconnect, go around and trim switches

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA231C Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA231 Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the automatic flight control and data system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses) and security in:
 - flight director components and interface
 - flight control components and interface
 - flight data recorders and interface
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to accurately and effectively isolate malfunctions in the above systems
- testing systems to isolate system malfunctions and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the automatic flight control system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of rotary wing automatic flight control systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- component attachment methods
- explaining the basic layout (block diagram level), function and operation of:
 - flight director components and interface
 - flight control components and interface
 - flight data recorders and interface
- explaining basic principles/functions relating to the above systems and associated with:
 - basic AC and DC circuit theory
 - digital fundamentals
 - analogue fundamentals
 - rotary wing flight theory
 - inner and outer loop control
 - rotary wing flight control system (mechanical, hydraulic and electro-mechanical types, trim and stabilisation)
 - flight control modes/channels
- WHS requirements
- system and component maintenance requirements and troubleshooting procedures
- relevant maintenance manuals.
-

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - flight director –indicators, computers, control boxes and interfaces with other systems
 - flight controls –servo actuators (roll, pitch, yaw and trim) computers and sensors
 - autopilot system –computers, sensors (gyros and/or accelerometers), controllers, mode selectors and system interface, CWS, disconnect, go around and trim switches.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA232 Test and troubleshoot aircraft pulse systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to test and troubleshoot pulse systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA226 Inspect aircraft electronic systems and components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--------------------------------|--|
| 1. Prepare for troubleshooting | 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability |
| 2. Test/adjust pulse systems | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Pulse system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction while observing all relevant work health and safety (WHS) requirements |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot pulse systems | 3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replaceable level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 Pulse system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required |
| | 3.5 Rectification requirements are determined |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Pulse systems and components include:

- Navigation radar
- Weather radar
- Radio altimeter (RADALT)
- Distance measuring equipment (DME)
- Air traffic control (ATC) transponder
- Automatic dependent surveillance-broadcast (ADS-B)
- Doppler
- Airborne collision avoidance system (ACAS)
- Displays, indicators, control boxes, antennae, waveguides, transmitters and receivers, and line replaceable units (LRUs)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – developed from MEA232C Test and troubleshoot aircraft pulse systems and components - not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA232 Test and troubleshoot aircraft pulse systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the pulse system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, and attaching hardware (including cabling/harnesses/transmission lines) and security in:
 - radar (navigation/weather) components and interface
 - ACAS components and interface
 - radio altitude components and interface
 - DME components and interface
 - ATC transponders
 - ADS-B
 - doppler navigation system
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the systems
- performing system testing to isolate system malfunctions and assess systems post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the pulse system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to testing and troubleshooting is essential. This is to be demonstrated through application across a range of aircraft pulse systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- explaining the basic layout (block diagram level), function and operation of:
 - radar (navigation/weather) components and interface
 - ACAS components and interface
 - radio altitude components and interface
 - distance measuring equipment components and interface
 - ATC transponders
 - ADS-B
 - doppler navigation system
- explaining basic principles/functions relating to the above systems and associated with:
 - basic alternating current (AC) and direct current (DC) circuit theory
 - digital fundamentals
 - analogue fundamentals
 - radar fundamentals
 - transmission lines, waveguide and antenna characteristics
- pulse system maintenance requirements and troubleshooting procedures
- relevant WHS practices, including those relating to ground functional testing of radar systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least three (3) of the following systems:
 - navigation radar

- weather radar
 - RADALT
 - DME
 - ATC transponder
 - ADS-B
 - doppler
 - ACAS
- and on at least one (1) item from:
 - displays, indicators, control boxes, antennae, waveguides, transmitters and receivers, and line replaceable units (LRUs).
 - This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
 - Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
 - Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
 - Individuals being assessed who have already attained either or both of MEA220 Inspect, test and troubleshoot aircraft primary radar systems and components, and MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components, will have covered Element 1 and will also have covered a significant proportion of the Performance Criteria for Elements 2 and 3 and will have covered Range of Conditions variables applicable to the unit. The Log of Industrial Experience and Achievement records relating to MEA220 Inspect, test and troubleshoot aircraft primary radar systems and components and MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA233 Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot inertial navigation and reference systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA207 Remove and install aircraft electronic system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Inspect inertial navigation and reference systems and components | 1.1 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.2 Inertial navigation and reference system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Defects are correctly identified and reported |
| 2. Test/adjust inertial navigation and reference systems and components | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Inertial navigation and reference system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Prepare for troubleshooting | 3.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability |
| 4. Troubleshoot inertial navigation and reference systems | 4.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | 4.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replaceable level |
| | 4.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 4.4 Inertial navigation and reference system faults are located and the causes of the faults are clearly |

identified and correctly recorded in maintenance documentation, where required

4.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA233C Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA233 Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to inertial navigation and reference systems being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in inertial navigation and reference system components
- applying logic processes, take and interpret system measurements, use test equipment and appropriate wiring diagrams and manuals to isolate system malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the pulse system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across an inertial navigation and reference system and its components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware
- the basic layout (block diagram level), function and operation of inertial navigation and reference systems
- the operating principles of inertial navigation and reference systems:

- terminology
- fundamental principles of inertial navigation
- two degree of freedom systems
- semi-analytical systems
- strapdown systems
- ring laser gyroscopes
- the various methods of navigation and how they are used by both aircraft conventional and electronic navigational instruments and systems
- maintenance requirements and troubleshooting procedures
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on an inertial navigation system and at least one (1) major system component/line replacement unit (LRU). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA234 Inspect, test and troubleshoot aircraft global navigation systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot global navigation systems (GNS) and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA206	Remove and install basic radio communication and navigation system components
MEA207	Remove and install aircraft electronic system components
MEA246	Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-----------------------------------|---|
| 1. Inspect GNS and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 GNS components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 Defects are correctly identified and reported |
| 2. Test/adjust GNS and components | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 GNS is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot GNS | 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replaceable level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 GNS faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures |

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA234C Inspect, test and troubleshoot aircraft global navigation systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA234 Inspect, test and troubleshoot aircraft global navigation systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the GNS being maintained
- recognition of system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in global navigation systems
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within GNS
- performing system testing to isolate system faults and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the GNS being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- GNS principles, including the use of satellites for navigation
- component attachment methods
- the basic layout (block diagram level), function and operation of GNS, including interpretation of indicators and operation of controls
- basic principles/functions relating to the system and associated with:
 - electromagnetic radiation and propagation
 - basic alternating current (AC) and direct current (DC) circuit theory
 - digital fundamentals
 - analogue fundamentals

- transmitter and receiver principles
- antenna characteristics
- transmission line characteristics
- interface with other avionic systems, e.g. flight management systems
- maintenance requirements and troubleshooting procedures
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a GNS and, in cases where the system is not replaced as a single unit, at least one (1) major system component/line replacement unit (LRU). This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
-

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA235 Perform advanced troubleshooting in aircraft avionic maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of fundamental system/component knowledge and applicable maintenance publications and test equipment to troubleshoot faults in avionic systems of fixed and rotary wing aircraft that are beyond the bounds of maintenance manual fault diagnosis guides during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit covers competencies required to progress from an Aircraft Maintenance Engineer at Certificate IV to the granting of a B2 maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide and the Companion Volume CASA Interface.

The skills and knowledge covered by the units of competency listed in the MEA Aeroskills Training Package for Aircraft Maintenance Engineer (Avionics or Mechanical as applicable) at Certificate IV are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics listed in the Companion Volume Implementation Guide.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|----------------------|---|
| 1. Verify the defect | 1.1 Available information from flight crew, such as flight phase, aircraft configuration etc., and maintenance documentation both current and previous history, are used as necessary, to |
|----------------------|---|

- assist in fault determination
- 1.2 Inspection of the affected system is carried out to check both physical integrity and correct operation
 - 1.3 Information gained from Central Maintenance Systems is verified against physical integrity and correct operation, where applicable
 - 1.4 The effects on a system from interfaces/integration with other systems are taken into account
2. Isolate the defect
 - 2.1 Logical processes, including the application of basic principles and system knowledge and known facts, are used to augment maintenance manual fault diagnosis guides to ensure efficient and accurate troubleshooting
 - 2.2 Specialist advice is obtained, where required and/or available, to assist with the troubleshooting process
 - 2.3 Faults are located and the causes of the defects are clearly identified and correctly recorded in maintenance documentation, including any other systems disturbed, where required
 3. Determine defect rectification requirements
 - 3.1 Defect rectification requirements are determined and the necessary repair action initiated once verification and isolation of the defect are confirmed
 4. Verify defect rectification
 - 4.1 Defect is rectified in accordance with approved maintenance data
 - 4.2 All systems disturbed or accessed during troubleshooting are restored as applicable using maintenance manuals, repair schemes or approved maintenance data
 - 4.3 All checks required by approved maintenance data to ensure correct operation of all disturbed systems are performed

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Systems and related components include:

- Electrical systems
- Electronic systems
- Instrument systems
- Radio communication and navigation systems
- Autoflight systems

Troubleshooting

Troubleshooting, for the purpose of this unit, is defined as:

- the troubleshooting from first principles, of defects beyond available maintenance data in the systems of fixed or rotary wing aircraft types. Troubleshooting must be demonstrated across a range of typical systems and system components that includes but is not limited to airframes, engine(s) and other systems (and parts thereof) operated by inherently electrical, electronic, instrument or radio principles or means. Coverage is not required of specific type systems that are included in type training and practical consolidation of training (PCT) activities leading to a specific type licence rating
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA235B Perform advanced troubleshooting in aircraft avionic maintenance

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA235 Perform advanced troubleshooting in aircraft avionic maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment.

- Skill must be demonstrated in the diagnosis of faults that are beyond the coverage of maintenance manual fault diagnosis guides in simulated applications in the training environment and/or in the workplace across a representative range of systems and components as specified in the Assessment Conditions.
- The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications related to avionic systems, and where applicable other system interfaces/integration. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical, as is the demonstrated ability to apply fundamental system theory in the logical diagnosis of complex faults.
- Evidence of transferability of skills and knowledge related to performance and supervision of inspection, testing and troubleshooting is essential. This must be demonstrated through application across a number of aircraft avionic systems, including system interfaces/integration.
-

Knowledge Evidence

For systems and components relevant to the scope of the licence/ratings sought as per CASR Parts 42, 66 and 145 Manuals of Standards, look for evidence that confirms knowledge of:

- theory related to system operation and interfaces between systems and with electrical/electronic control media to a level that will facilitate the diagnosis of faults beyond the level of maintenance manual fault diagnosis guides using reported symptoms and functional test results
- component construction and theory of operation to a level that will facilitate the diagnosis of faults beyond the level of maintenance manual fault diagnosis guides using reported symptoms and functional test results
- advanced fault diagnostic techniques
- condition monitoring and trend analysis techniques.

Assessment Conditions

- Competency is assessed in the workplace or simulated workplace and shall involve successfully dealing with a number of maintenance and fault scenarios across a range of avionic systems and related system components of:
 - electrical systems
 - electronic systems
 - instrument systems
 - radio communication and navigation systems
 - autoflight systems
- The troubleshooting approach should clearly demonstrate an in-depth knowledge of underpinning theory of a system, with this knowledge being used in a logical process to augment and extend the scope of the aircraft/system fault-finding guide. The fault rectification work plan should take account of applicable safety (including safe handling of heavy components) and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision without intervention and the ability has been demonstrated to identify the causes of defects not covered fully by maintenance manual fault diagnosis guides. Competency shall be assessed via simulated activities at the CASR Part 147 Maintenance Training Organisation and through performance during observed workplace activities.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.
-

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA238 Perform routine removal and installation of miscellaneous aircraft electrical hardware/components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and relevant maintenance publications and documentation to remove and install a range of electrical components and electrical hardware under the guidance of a qualified person, including both on and off-aircraft work during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate II training pathway. It covers the competencies required for the removal and installation under qualified person guidance of a range of aircraft electrical components and items of hardware that can have bolted, soldered or plug connections.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Prepare to remove aircraft electrical hardware | 1.1 The removal task is planned under qualified person guidance using applicable maintenance documentation and enterprise procedures |
| | 1.2 System safety is confirmed with the qualified person |
| 2. Remove aircraft electrical hardware | 2.1 Physical removal of electrical hardware is carried out in accordance with enterprise procedures and applicable maintenance documentation while observing all relevant work health and safety (WHS) requirements |
| 3. Complete aircraft electrical hardware removal process | 3.1 Required documentation is accurately completed and correctly processed in accordance with enterprise procedures |
| | 3.2 Removed components are tagged, packaged or discarded in accordance with specified procedures |
| 4. Prepare to install aircraft electrical hardware | 4.1 The installation task is planned under qualified person guidance using applicable maintenance documentation and enterprise procedures |
| | 4.2 Electrical hardware components to be installed are checked to confirm correct part numbers |
| 5. Install aircraft electrical hardware | 5.1 Physical installation of electrical hardware is carried out in accordance with enterprise procedures and applicable maintenance documentation |
| 6. Complete aircraft electrical hardware installation process | 6.1 Required documentation is accurately completed and correctly processed in accordance with enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Electrical hardware includes:

- Switches, relays, lamps, terminal blocks, current limiters, circuit breakers, fuses, sockets, potentiometers, capacitors, inductors, magnetic amplifiers, transformers, rheostats, resistors and diodes, miscellaneous sensors and minor components hard mounted throughout the aircraft, busbars, lugs, ferrules, splices, connectors, and electrical, electronic cables and looms
- Oxygen systems and components, and fuel tank components and integrated hardware are not included

Unit Mapping Information

Release 1 – equivalent to MEA238B Perform routine removal and installation of miscellaneous aircraft electrical hardware/components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA238 Perform routine removal and installation of miscellaneous aircraft electrical hardware/components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using enterprise procedures, applicable maintenance documentation and aircraft publications relating to the electrical system and components being worked on
- the preparation and termination of electrical cables to aircraft industry standards, using:
 - crimping techniques
 - soldering techniques
 - solder sleeve joints
- the correct identification of aircraft wire markings, terminal block identification and plug/socket pin numbering systems
- electrical loom and harness installation ensuring minimum bends are maintained, cable is not in tension, plugs are correctly aligned, security of route ensures no chaffing of insulation, adequate clipping and cable ties have been utilised and construction complies with aircraft industry standards
- positive identification of miscellaneous electrical hardware and/or components.

The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that applicable cleanliness requirements and WHS safety precautions are fully observed, and an awareness of electrostatic discharge procedures.

Evidence of transferability of skills and knowledge related to enterprise procedures associated with removal and installation is essential.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- electrostatic discharge procedures
- connection of hardware, plugs and terminals points
- wire marking, terminal block identification and plug/socket numbering systems.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that applicable general-purpose tools, and test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under qualified person guidance on a range of the electrical components/hardware listed in the Range of Conditions that are applicable to the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
-

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A239 Fabricate aircraft electrical looms and harnesses

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and maintenance publications in aircraft hangars and workshops to fabricate aircraft electrical looms and harnesses under qualified person guidance for general use in electrical systems during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate II training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Prepare to fabricate aircraft electrical looms and harnesses | 1.1 Appropriate materials, tools and equipment are selected and prepared for the particular task in accordance with applicable maintenance documentation, enterprise procedures and under qualified person guidance |
| | 1.2 Assembly or fabrication jigs, where applicable, are aligned to ensure accurate fabrication of components |
| 2. Fabricate aircraft electrical looms and harnesses | 2.1 Components or parts are fabricated in accordance with qualified person guidance, applicable maintenance documentation and enterprise procedures while observing all relevant work health and safety (WHS) requirements |
| 3. Perform routine tests on aircraft electrical looms and harnesses | 3.1 Under qualified person guidance test equipment and/or rigs are used, where applicable, to confirm serviceability of finished components |
| 4. Complete the fabrication process with regard to aircraft electrical looms and harnesses | 4.1 Fabricated components are tagged, sealed and packaged within specified procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Components or parts include:

- Electrical looms, harnesses and cables **except** for:
 - data bus cables

- co-axial cables
- fibre optic cables
- fire detection/extinguishing systems
- oxygen systems
- fuel tanks and integrated hardware

Unit Mapping Information

Release 1 – equivalent to MEA239B Fabricate aircraft electrical looms and harnesses

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA239 Fabricate aircraft electrical looms and harnesses

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved fabrication procedures and processes relating to electrical looms, cables, and harnesses
- recognising the integrity/security of electrical component crimps, joints and plug/connector pins
- fabricating cables, harnesses and looms, including wire marking, to approved industry standards
- under qualified person guidance performing testing to assess post-construction serviceability according to enterprise procedures.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that the general aspects of material specification and selection, measurement and fabrication be related to specific aircraft component applications to the extent necessary to unambiguously understand expert guidance.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- electrical wire gauges and standards
- wire marking conventions and procedures
- wire terminations, soldering and crimping.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified by aircraft in the maintenance manuals. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.

- Evidence of knowledge about individual components and their links with systems will be necessary to supplement evidence of ability to interpret qualified person guidance and enterprise procedures to fabricate looms, harnesses and cables before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- Safety precautions applicable to the manufacturing of electrical looms, harnesses and cables are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action, to ensure safety and quality issues are addressed.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under qualified person guidance on a representative range of electrical loom, cable and harness fabrication tasks with the exception of the items listed in the Range of Conditions. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA240 Use electrical test equipment to perform basic electrical tests

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills in the use of electrical test equipment under qualified person guidance to measure voltage and current, and to test continuity, insulation and bonding on aircraft and components both in the hangar and workshop during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate II training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Prepare test equipment to perform basic electrical tests | 1.1 Appropriate electrical test equipment is selected and confirmed with a qualified person |
| | 1.2 Test equipment is checked for serviceability and applicable leads are fitted, where required |
| | 1.3 Applicable function and range of measurement is set and confirmed with a qualified person |
| 2. Test component in accordance with enterprise procedures using electrical test equipment | 2.1 Test points and polarity are determined |
| | 2.2 Required parameters are measured with the test equipment while observing all relevant work health and safety (WHS) requirements |
| | 2.3 Results are recorded in accordance with enterprise procedures, under qualified person guidance |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Required parameters include measurement/testing of:

- Volts and amps
- Continuity, resistance and insulation
- Bonding

Unit Mapping Information

Release 1 – equivalent to MEA240B Use electrical test equipment to perform basic electrical tests

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA240 Use electrical test equipment to perform basic electrical tests

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- setting up applicable test equipment
- determining test points and polarity
- measuring required parameters
- recording results under qualified person guidance.

The underlying skills inherent in this unit should be transferable into all areas that require the use of basic electrical test equipment. It is essential that the general aspects of electrical test equipment identification, preparation for use and safe application to a representative range of measurement and testing tasks are clearly demonstrated.

Evidence of knowledge about the preparation and use, in accordance with enterprise procedures, of the range of test equipment used for the measurement and testing tasks listed in the Range of Conditions, and of the methods used to identify applicable polarity and connection to components and circuits for required measurement or testing.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the range of relevant electrical test equipment used to measure or test:
 - volts and amps
 - continuity, resistance and insulation
 - bonding
- identification methods used to confirm test equipment is serviceable and current regarding calibration
- use of selectors and scale adjustment of each item of test equipment to ensure accurate measurement of applicable parameter
- methods of connection of test equipment to components being tested
- methods used to determine polarity and applicable connection points for measurement or testing.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using relevant electrical test equipment as specified in maintenance documentation for a given task, and in accordance with enterprise procedures under expert guidance.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under qualified person guidance on a representative range of electrical measurement and testing tasks as provided for in the Range Statement. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA241 Perform aircraft weight and balance calculations as a result of modifications

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of mathematical formulae to calculate the weight and balance effect of components installed in fixed and rotary wing aircraft during modification incorporation and may involve individual activities or supervision of other personnel.

The unit covers competencies required to progress from an Aircraft Maintenance Engineer at Certificate IV to the granting of a B2 Aircraft Maintenance Engineer Licence in the Avionics category under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide and the Companion Volume CASA Interface.

The skills and knowledge covered by the units of competency listed in the MEA Aeroskills Training Package for Aircraft Maintenance Engineer (Avionics or Mechanical as applicable) at Certificate IV are prerequisite to the attainment of the elements of competency specified in this unit.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | |
|--|-----|--|
| 1. Calculate the weight and balance impact of a modification | 1.1 | The requirement for aircraft weighing is determined |
| | 1.2 | The new empty weight of the aircraft is determined and it is ensured that the weight is within the |

predetermined limits set by the Continuing Airworthiness Management Organisation (CAMO)

- 1.3 The new empty weight centre of gravity of the aircraft is calculated using the weight and moment arm data for a modification and it is ensured that the centre of gravity is within the predetermined limits set by the CAMO
- 1.4 Maintenance records are updated with new figures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA241C Perform aircraft weight and balance calculations as a result of modifications

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA241 Perform aircraft weight and balance calculations as a result of modifications

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- calculating the effect on aircraft weight and centre of gravity of components installed during modification incorporation using weight and moment arm data.

The underlying skills inherent in this unit should be transferable across a range of aircraft types. Ability to interpret the instructions for configuring and weighing aircraft is critical.

Evidence of transferability of skills and knowledge related to aircraft weight and calculation of centre of gravity is essential

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- mathematical formulae used to calculate centre of gravity of an aircraft.

Assessment Conditions

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision without intervention.
- This shall be established via simulated activities at the CASR Part 147 Maintenance Training Organisation and performance during observed workplace activities.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA246 Fabricate and/or repair aircraft electrical hardware or parts

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and knowledge of wiring standards and specifications to fabricate aircraft electrical looms, harnesses and cables in aircraft maintenance hangars and workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of all Avionic Certificate IV training pathways. It is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201 Remove and install miscellaneous aircraft electrical hardware/components

MEA260 Use electrical test equipment

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Interpret specifications and organise materials | 1.1 Specifications are interpreted to determine the dimensions and procedure for fabrication |
| | 1.2 Appropriate materials, tools and equipment are selected and prepared for the particular specification requirements |
| 2. Fabricate/repair electrical components or parts | 2.1 Assembly or fabrication jigs, where applicable, are aligned to ensure accurate fabrication of components |
| | 2.2 Components or parts are fabricated in accordance with required specifications while observing all relevant work health and safety (WHS) requirements including the use of material safety data sheets (MSDS) and personal protective equipment (PPE) |
| 3. Test fabricated/repairs components or parts | 3.1 Test equipment and/or rigs are used, where applicable, to confirm serviceability of finished components |
| | 3.2 Fabricated components are tagged, sealed and packaged within specified procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Components or parts include:

- Electrical looms, harnesses and cables associated with:
 - power distribution
 - ignition

- Procedures and requirements include:**
- control circuits
 - signal circuits
 - Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA246C Fabricate and/or repair aircraft electrical hardware or parts

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA246 Fabricate and/or repair aircraft electrical hardware or parts

Modification History

Release 1 - New unit of competency

Performance Evidence

- Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:
- applying relevant WHS practices, including the use of PPE and reference to MSDS
- using approved repair/fabrication procedures and processes relating to electrical cables, harnesses, antenna leads and aerial components
- recognising the integrity/security of electrical component crimps, wire wrapping, joints, and plug/connector pins
- constructing cables, harnesses and looms, including wire marking, to approved industry standards
- performing component testing to assess post-construction serviceability.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that the general aspects of material specification and selection, measurement and fabrication/manufacture are related to specific aircraft component applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component and system operation
- aircraft wiring specifications and standards
- standard repair methods for:
 - electrical cables
 - ignition harnesses
 - fire warning system harnesses
 - coaxial cables, such as antenna leads
 - aerial components
- electrical plugs and connectors
- soldering methods
- fabrication methods for the above wiring and cables
- wire marking methods

- assembly of electrical cables into wiring looms
- relevant WHS procedures
- how to obtain relevant MSDS
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified by aircraft in the maintenance manuals. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Evidence of knowledge about individual components and their links with systems will be necessary to supplement evidence of ability to interpret requirements and fabricate components before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of tasks, including:
 - power distribution
 - ignition
 - control circuits
 - signal circuits.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA252 Test, align and troubleshoot aircraft synchro and servo system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, test equipment and knowledge of analogue theory to test, align and troubleshoot synchro and servo components, from fixed and rotary wing aircraft, that are repaired or overhauled in aviation maintenance workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Component Maintenance Workshop Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA260	Use electrical test equipment
MEA261	Use electronic test equipment

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.	demonstrate achievement of the element.
1. Test synchro and servo system components	<p>1.1 Synchro and servo system components are correctly prepared and connected to the appropriate test equipment/rig in accordance with approved procedures</p> <p>1.2 Components are functionally tested or cycled through the prescribed test procedures in accordance with maintenance manual for evidence of serviceability or malfunction while observing all relevant work health and safety (WHS) requirements</p> <p>1.3 Faults or unserviceabilities are correctly identified and recorded on appropriate maintenance documentation</p>
2. Align synchro and servo system components	<p>2.1 Synchro and servo system components are adjusted in accordance with approved procedures and maintenance manuals until operating within prescribed limits/tolerances</p>
3. Troubleshoot synchro and servo system components	<p>3.1 Available information from maintenance records and inspection and test results is used, where necessary, to assist in fault determination</p> <p>3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting</p> <p>3.3 Synchro and servo system component faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required</p> <p>3.4 Fault rectification requirements are determined</p>

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Component testing, alignment and troubleshooting is performed on:

- Synchro system components
- Servo system components

Synchro and servo system components can come from any of:

- Air data computers, auto pilot servos, remote position indicators and other similar applications
-

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA252B Test, align and troubleshoot aircraft synchro and servo system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA252 Test, align and troubleshoot aircraft synchro and servo system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved repair procedures and processes relating to synchro and servo system components
- recognising the serviceability state and repair requirements for:
 - synchro/servo system error detection devices
 - direct current (DC) and alternating current (AC) synchronous components
 - gyroscopic instruments (mechanical, electro-mechanical, vacuum/pressure types)
 - flight control servo devices
- performing component testing to isolate/confirm faults and assessing post-repair/overhaul serviceability
- correctly aligning synchro and servo system components to prescribed specifications
- applying logic processes to isolate synchro and servo system component faults.

The underlying skills inherent in this unit should be transferable across a range of testing, aligning and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with synchro and servo system components. Ability to interpret inspection and testing procedures and specifications (allowable limits) and apply them in practice is critical. It is essential that testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with.

This must be demonstrated through application across a range of the synchro and servo system components listed in the Assessment Conditions that are applicable to the enterprise.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component and system operation

- the basic function and operation of synchro and servo system components to enable testing for fault isolation/confirmation and to determine repair or overhaul requirements and serviceability status post-repair or overhaul
- basic principles/functions, relating to synchro and servo system components and associated with:
 - advanced analogue fundamentals
 - synchronous systems
 - gyroscopes.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special-purpose tools and test equipment would be used where appropriate.
- The application of testing procedures should also clearly indicate knowledge of system operation. System operation knowledge, the relationship of individual components and the links with other systems (if applicable) will be necessary to supplement evidence of ability to troubleshoot the component within the limits of the fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of components applicable to the enterprise from each of:
 - synchro system components
 - servo system components.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA260 Use electrical test equipment

Modification History

Release 2 - Phase angle measurement (in Range of Conditions) now dependent on enterprise need

Release 1 - New unit of competency

Application

This unit of competency requires application of skills in the use of electrical test equipment to measure voltage, current, frequency and phase angle, and to test continuity, resistance, insulation and bonding.

Applications include aircraft and components both in the hangar and workshop during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of all Avionic Certificate IV training pathways. It is also part of the Mechanical Aircraft Maintenance Engineer licensing pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications

- MEA108 Complete aviation maintenance industry documentation
- MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-----------------------------------|---|
| 1. Select required test equipment | 1.1 System/component test requirements are identified |
| | 1.2 Appropriate test equipment is selected |
| 2. Prepare test equipment for use | 2.1 Test equipment is checked for serviceability and applicable leads are fitted where required |
| | 2.2 Applicable function and range of measurement is selected as required |
| 3. Test system or component | 3.1 Test points and polarity are determined |
| | 3.2 Required parameters are measured with the test equipment while observing all relevant work health and safety (WHS) requirements |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

System/component test requirements include:

- Measurement of or testing:
 - volts, amps and power
 - frequency
 - phase angle (where applicable to the enterprise)
 - continuity, resistance and insulation
 - bonding

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 2 - phase angle measurement (in Range of Conditions and Assessment Requirements) now dependent on enterprise need. No change in outcome

Release 1 – equivalent to MEA260B Use electrical test equipment

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA260 Use electrical test equipment

Modification History

Release 2 - Phase angle measurement (in Assessment Conditions) now dependent on enterprise need

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using selectors and scale adjustment of each item of test equipment to ensure accurate measurement of applicable parameter
- connecting test equipment to components or circuits
- determining polarity and applicable connection points for measurement or testing.

The underlying skills inherent in this unit should be transferable into all areas which require the use of electrical test equipment. It is essential that the general aspects of electrical test equipment selection, preparation for use and safe application to a representative range of measurement and testing tasks are clearly understood.

Evidence is required of knowledge about the selection and use of the range of test equipment used for the measurement and testing tasks listed in the Range of Conditions, and of the methods used to identify applicable polarity and connection to components and circuits for required measurement or testing.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the range of electrical test equipment used to measure or test:
 - volts, amps and power
 - frequency
 - phase angle
 - continuity, resistance and insulation
 - bonding
- test equipment construction and calibration, and testing for serviceability.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using electrical test equipment specified in maintenance documentation. It is also expected that applicable test equipment can be selected on the basis of general trade knowledge where specific test equipment is not specified.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision in the selection of appropriate items of test equipment and their use to perform the measurements and test each of:
 - volts, amps and power
 - frequency
 - phase angle (may be omitted if not relevant to the enterprise)
 - continuity, resistance and insulation
 - bonding.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
-

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A261 Use electronic test equipment

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills in the use of electronic test equipment to measure electronic circuit parameters and test performance.

Applications include aircraft components both in the hangar and workshop undergoing scheduled or unscheduled maintenance involving individual and team activities.

The unit is part of Avionic Certificate IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-----------------------------------|---|
| 1. Select required test equipment | 1.1 System/component test requirements are identified |
| | 1.2 Appropriate test equipment is selected |
| 2. Prepare test equipment for use | 2.1 Test equipment is checked for serviceability and applicable leads are fitted where required |
| | 2.2 Applicable function and range of measurement is selected as required |
| 3. Test system or component | 3.1 Test points and polarity are determined |
| | 3.2 Required parameters are measured with the test equipment while observing all relevant work health and safety (WHS) requirements |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Electronic test equipment includes:

- Electronic multimeters
- Phase-angle voltmeters (where applicable to the enterprise)
- Oscilloscopes (dual differential, differential, delayed time base, storage)
- Current probes
- Logic and discrete component testers
- Electronic component substitution boxes and

- Procedures and requirements include:**
- miscellaneous test adapters
 - Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA261C Use electronic test equipment

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA261 Use electronic test equipment

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- connecting test equipment to components or circuits
- determining polarity and applicable connection points for measurement or testing.

The underlying skills inherent in this unit should be transferable into all areas that require the use of electronic test equipment as listed in the Range of Conditions. It is essential that the general aspects of electronic test equipment selection, preparation for use and safe application to a representative range of measurement and testing tasks are clearly understood.

Evidence is required of knowledge about the selection and use of the range of test equipment listed in the Range of Conditions, and of the methods used to identify applicable polarity and connection to components and circuits for required measurement or testing.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the construction, calibration for use and testing for serviceability of:
 - electronic multimeters
 - phase-angle voltmeters
 - oscilloscopes (dual differential, differential, delayed time base and storage)
 - current probes
 - logic and discrete component testers
 - electronic component substitution boxes and miscellaneous test adapters
- use of selectors and scale adjustment of each item of test equipment to ensure accurate measurement of applicable parameters
- high speed oscilloscope techniques, probe calibration and safety precautions.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using electronic test equipment specified in maintenance documentation. It is also expected that applicable test equipment can be selected on the basis of general trade knowledge where specific test equipment is not specified.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision, with each item of test equipment having been used to measure electronic circuit parameters and test performance:
 - electronic multimeters
 - phase-angle voltmeters (may be omitted where not applicable to the enterprise)
 - oscilloscopes (dual differential, differential, delayed time base, storage)
 - current probes
 - logic and discrete component testers
 - electronic component substitution boxes and miscellaneous test adapters.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA262 Modify/repair aircraft component single layer printed circuit boards

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, including high reliability hand soldering, and knowledge of standard practices and techniques in the repair of single layer printed circuit boards from aircraft avionic components that are repaired in aviation workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA260 Use electrical test equipment

MEA261 Use electronic test equipment

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Inspect single layer printed circuit cards and associated components | 1.1 Relevant maintenance documentation, including component defect reports, where applicable, is interpreted and matched by part and serial number |
| | 1.2 Preparation of work area and circuit card assemblies is appropriate to allow for effective detailed inspection of |

- all substrate, circuit tracks, edge connectors and attached components, taking into account any static discharge procedures
- 1.3 Circuit card assemblies are visually or physically inspected for physical integrity of substrate, circuit tracks, edge connectors and attached components
 - 1.4 Modification status is established to assist in determining repair requirements
 - 1.5 Defects are correctly identified and reported
2. Test single layer printed circuit cards and associated components
 - 2.1 Circuit card assemblies are correctly prepared and connected to the appropriate test facility in accordance with approved procedures, or circuit card assemblies are correctly prepared and connected in situ to allow required test procedures to be performed
 - 2.2 Circuit card assemblies are functionally tested in accordance with normal trade practice and approved maintenance documentation for evidence of serviceability or malfunction
 - 2.3 Circuit card assemblies, attached hardware and electronic components are electronically and/or physically adjusted/aligned in accordance with maintenance manuals or other prescribed procedures
3. Troubleshoot single layer printed circuit cards and associated components
 - 3.1 Maintenance documentation, physical inspection and test results are used, where applicable, to assist in fault determination
 - 3.2 Maintenance manual fault diagnosis guides, logical processes and test equipment are used appropriately to ensure efficient and accurate troubleshooting
 - 3.3 Component faults are located and the causes of the faults are clearly identified and recorded in maintenance documentation, where required
 - 3.4 Rectification requirements are determined
4. Dismantle single layer printed circuit cards and associated components
 - 4.1 Conformal/protective coatings are removed from the circuit card assembly to the extent required to effect necessary repairs and in accordance with maintenance manuals, and industry or enterprise standards as applicable

- 4.2 Appropriate work health and safety (WHS) requirements are observed at all times during maintenance procedures and applicable material safety data sheets (MSDS) and personal protective equipment (PPE) are used
 - 4.3 Circuit card assembly is dismantled to the extent necessary to allow repair of all identified faults
 - 4.4 Parts for processing are correctly tagged and despatched
 - 4.5 Parts for retention and re-fitment are correctly packaged and stored in accordance with approved procedures to avoid physical and electrostatic damage
 - 4.6 Parts for disposal are correctly packaged and processed to accord with statutory requirements pertaining to dangerous goods
5. Assemble single layer printed circuit cards and associated components
 - 5.1 Parts removed for access, and replacement parts, are collected ensuring appropriate modification status, component tolerances and assembly configuration is maintained
 - 5.2 Printed circuit card and associated components are assembled in accordance with maintenance manuals, and all electrical joints meet the approved standard of the equipment manufacturer, or industry standard, as appropriate
 - 5.3 Circuit substrate material, circuit tracks, edge connectors and through-hole eyelets are reworked, as necessary, to restore printed circuit card to a serviceable condition
 - 5.4 Any conformal/protective coatings removed are replaced to the approved standard of the equipment manufacturer, or industry standard, as appropriate
 - 5.5 Rework techniques are in accordance with industry approval procedures and relevant WHS precautions are observed and applicable MSDS and items of PPE are used

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Circuit card components include:

- Capacitors, resistors, wires, semiconductors, inductors, transformers, switches, connectors, multi-pin ICs, terminal posts and heat-sink materials, and will include electrostatic sensitive devices

Procedures and standards include:

- Procedures and standards for repair of printed circuit card assemblies, including a range of general engineering hand skills in addition to specific high reliability soldering skills.
- Standards applicable in a given situation will be defined by equipment manufacturers and/or regulatory authorities and the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA262B Modify/repair aircraft component single layer printed circuit boards

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA262 Modify/repair aircraft component single layer printed circuit boards

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- applying relevant WHS practices including the selection and use of PPE and the use of MSDS
- using approved repair procedures and processes relating to single and double sided circuit cards
- recognising unacceptable soldered connections, damage circuit card components, circuit tracks integrity, substrate damage and edge connector condition
- applying static-safe work area practices
- reworking unacceptable printed circuit board soldered connections, via acceptable de-soldering and soldering techniques
- disassembling and assembling printed circuit board cards to approved industry standards and prescribed specifications
- performing printed circuit board tests using relevant test equipment and processes to isolate printed circuit board track faults and assess serviceability state post repair
- correctly disassembling, preparing repair area, reworking the card to industry standards, replacing faulted components and assembling card for post-repair inspection and testing.

It is essential that substrate abrasion and rebuilding techniques and precautions associated with handling and assembly of electrostatic and temperature sensitive devices are fully observed, understood and complied with. A high level of awareness of safety precautions associated with beryllium materials and use of fluxes and solvents is to be demonstrated.

Evidence of transferability of skills and knowledge related to single layer printed circuit card assembly and repair is essential before undertaking any action. This may be demonstrated through application of the techniques involved across a representative range of circuit card substrate materials and attached components. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component operation
- basic principles/functions relating to electrical and electronic components on printed circuit boards
- substrate materials
- types of conformal coating
- types of soldering equipment and solders used in track repair and component assembly
- how to obtain MSDS
- WHS procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that applicable general and special-purpose test equipment found in most routine situations would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of cards with various substrate materials and components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA263 Modify/repair aircraft component multi-layer printed circuit boards

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills (including those required to gain access to inner layers and repair outer layers after track repair), including high reliability hand soldering, and knowledge of standard practices and techniques in the repair of multi-layer printed circuit boards from aircraft avionic components that are repaired in aviation workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

This unit is part of the Avionic Certificate IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA260	Use electrical test equipment
MEA261	Use electronic test equipment

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Inspect multi-layer printed circuit cards | 1.1 Relevant maintenance documentation, including component defect reports where applicable, is interpreted |
|--|---|

- and associated components
- and matched by part and serial number
- 1.2 Preparation of work area and circuit card assemblies is appropriate to allow for effective detailed inspection of all substrate, circuit tracks, edge connectors and attached components, taking into account any static discharge procedures
 - 1.3 Circuit card assemblies are visually or physically inspected for physical integrity of substrate, circuit tracks, edge connectors and attached components
 - 1.4 Modification status is established to assist in determining repair requirements
 - 1.5 Defects are correctly identified and reported
2. Test multi-layer printed circuit cards and associated components
- 2.1 Circuit card assemblies are correctly prepared and connected to the appropriate test facility in accordance with approved procedures, or circuit card assemblies are correctly prepared and connected in situ to allow required test procedures to be performed
 - 2.2 Circuit card assemblies are functionally tested in accordance with normal trade practice and approved maintenance documentation for evidence of serviceability or malfunction
 - 2.3 Circuit card assemblies, attached hardware and electronic components are electronically and/or physically adjusted/aligned in accordance with maintenance manuals or other prescribed procedures
3. Troubleshoot multi-layer printed circuit cards and associated components
- 3.1 Maintenance documentation, physical inspection and test results are used, where applicable, to assist in fault determination
 - 3.2 Maintenance manual fault diagnosis guides, logical processes and test equipment are used appropriately to ensure efficient and accurate troubleshooting
 - 3.3 Component faults are located and the causes of the faults are clearly identified and recorded in maintenance documentation, where required
 - 3.4 Rectification requirements are determined

4. Dismantle multi-layer printed circuit cards and associated components
- 4.1 Conformal/protective coatings are removed from the circuit card assembly to the extent required to effect necessary repairs and in accordance with maintenance manuals, industry or enterprise standards as applicable
 - 4.2 Appropriate work health and safety (WHS) requirements are observed at all times during maintenance procedures and applicable material safety data sheets (MSDS) and personal protective equipment (PPE) are used
 - 4.3 Circuit card assembly is dismantled to the extent necessary to allow repair of all identified faults
 - 4.4 Parts for processing are correctly tagged and despatched
 - 4.5 Parts for retention and re-fitment are correctly packaged and stored in accordance with approved procedures to avoid physical and electrostatic damage
 - 4.6 Parts for disposal are correctly packaged and processed to accord with statutory requirements pertaining to dangerous goods
5. Assemble multi-layer printed circuit cards and associated components
- 5.1 Parts removed for access, and replacement parts, are collected ensuring appropriate modification status, component tolerances and assembly configuration is maintained
 - 5.2 Any conformal/protective coatings removed are replaced to the approved standard of the equipment manufacturer, or industry standard, as appropriate
 - 5.3 Rework techniques are in accordance with industry approval procedures and relevant WHS precautions are observed and applicable MSDS and items of PPE are used
 - 5.4 Printed circuit card and associated components are assembled in accordance with maintenance manuals, and all electrical joints meet the approved standard of the equipment manufacturer, or industry standard, as appropriate
 - 5.5 Circuit substrate material, circuit tracks, edge connectors and through-hole eyelets are reworked, as necessary, to restore printed circuit card to a serviceable condition

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Circuit card attached components include:

- Capacitors, resistors, wires, semiconductors, inductors, transformers, switches, connectors, multi-pin ICs, terminal posts and heat-sink materials, and will include electrostatic sensitive devices

Procedures and standards include:

- Procedures and standards for repair of printed circuit card assemblies, including a range of general engineering hand skills in addition to specific high reliability soldering skills.
- Standards applicable in a given situation will be defined by equipment manufacturers and/or regulatory authorities and the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA263B Modify/repair aircraft component multi-layer printed circuit boards

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA263 Modify/repair aircraft component multi-layer printed circuit boards

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved repair procedures and processes relating to multi-layer circuit cards
- recognising unacceptable soldered connections, damaged circuit card components, circuit tracks integrity, substrate damage and edge connector condition
- applying static-safe work area practices
- reworking unacceptable printed circuit board soldered connections via acceptable de-soldering and soldering techniques
- disassembling and assembling printed circuit board cards to approved industry standards and prescribed specifications
- performing printed circuit board tests using relevant test equipment and processes to isolate printed circuit board track faults and assess serviceability state post repair
- correctly disassembling, preparing repair area, reworking the card to industry standards, replacing faulted components and assembling card for post-repair inspection and testing

It is essential that substrate abrasion and rebuilding techniques and precautions associated with handling and assembly of electrostatic and temperature sensitive devices are fully observed, understood and complied with. A high level of awareness of safety precautions associated with beryllium materials and use of fluxes and solvents is to be demonstrated.

Evidence of transferability of skills and knowledge related to multi-layer printed circuit card assembly and repair is essential before undertaking any action. This may be demonstrated through application of the techniques involved across a representative range of circuit card substrate materials and attached components. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component operation

- basic principles/functions relating to electrical and electronic components on printed circuit boards
- substrate materials
- types of conformal coating
- types of soldering equipment and solders used in track repair and component assembly
- de-soldering techniques
- optical equipment and tools used in multi-layer printed circuit board repair
- how to obtain MSDS
- WHS procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that applicable general and special-purpose test equipment found in most routine situations would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of cards with various substrate materials and components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA264 Remove and install aircraft electrical/avionic components during line maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal and installation from fixed and rotary wing aircraft of a limited range of aircraft electrical and avionic system components that are within the privileges of the Aircraft Maintenance Engineer A Licence during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

It is one of the units required for the granting of the chosen Aircraft Maintenance Engineer A Licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA265 Remove and install general aircraft electrical hardware

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Remove aircraft electrical system components

1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety

1.2 Electrical component removal is carried out in accordance with the applicable maintenance manual while observing

- all relevant work health and safety (WHS) requirements
 - 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 1.4 Removed components are tagged and packaged in accordance with specified procedures
- 2. Remove avionic system components
 - 2.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
 - 2.2 Avionic component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements
 - 2.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 2.4 Removed components are tagged and packaged in accordance with specified procedures
- 3. Install aircraft electrical system components
 - 3.1 Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
 - 3.2 Physical installation of electrical components is performed in accordance with the applicable maintenance manual ensuring appropriate adjustment/alignment with mechanical interface is carried out
 - 3.3 System is reinstated to correct operational condition in preparation for testing, as necessary
 - 3.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
- 4. Install avionic system components
 - 4.1 Avionic components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
 - 4.2 Physical installation of electrical components is performed in accordance with the applicable maintenance manual ensuring appropriate adjustment/alignment with mechanical interface is carried out

- 4.3 System is reinstated to correct operational condition in preparation for testing, as necessary
- 4.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Electrical components include:

- Ovens, boilers and beverage makers
- Aircraft internal and external lights, filaments and flash tubes
- Aircraft main and auxiliary power unit (APU) batteries
- Static wicks

Avionic components include:

- Passenger entertainment system components but excluding public address

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA264A Remove and install aircraft electrical/avionic components during line maintenance

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA264 Remove and install aircraft electrical/avionic components during line maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using maintenance publications in identifying/locating:
 - ovens, boilers and beverage makers
 - aircraft main and APU batteries (lead acid and nickel cadmium) and associated mounting equipment, including related anti-vibration aids and battery temperature monitoring systems
 - aircraft internal and external lights
 - static wicks
 - passenger entertainment system components
- correctly connecting:
 - ovens, boilers and beverage makers
 - aircraft main and APU batteries (lead acid and nickel cadmium) and associated mounting equipment, including related anti-vibration aids and battery temperature monitoring systems
 - aircraft internal and external lights
 - passenger entertainment system components
- application of standard procedures, including handling of electrostatic sensitive devices

It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across the range of applicable components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- procedures for handling electrostatic sensitive devices
- relevant WHS practices
- the use of applicable maintenance documentation and aircraft publications relating to electrical and passenger entertainment systems
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that applicable general-purpose tools, and test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware, and the need for functional testing as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision but without intervention on at least one (1) component from each of the following groups of components:
 - ovens, boilers and beverage makers
 - aircraft internal and external lights, filaments and flash tubes
 - aircraft main and APU batteries
 - static wicks
 - passenger entertainment system components but excluding public address.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA265 Remove and install general aircraft electrical hardware

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills in the removal and installation from fixed or rotary wing aircraft of electrical hardware, including items of general electrical hardware, that are within the privileges of the Aircraft Maintenance Engineer A Licence during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit forms part of the Civil Aviation Safety Authority (CASA) requirement for the granting of the chosen Aircraft Maintenance Engineer A Licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Remove general aircraft electrical hardware | 1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety |
| | 1.2 Removal of electrical hardware is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| | 1.4 Removed components are tagged, packaged or discarded in accordance with specified procedures |
| 2. Install general aircraft electrical hardware | 2.1 Electrical hardware components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life |
| | 2.2 Physical installation of electrical hardware is carried out in accordance with the applicable maintenance manual |
| | 2.3 System is reinstated to correct physical condition in preparation for testing, as necessary |
| | 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Removal and installation of electrical hardware includes one or more of the following connection methods:

- Bolted
- Plug connectors

Electrical hardware includes:

- Switches
- Relays
- Lamps
- Terminal blocks
- Current limiters
- Circuit breakers
- Fuses
- Sockets
- Potentiometers
- Capacitors
- Inductors
- Magnetic amplifiers
- Transformers
- Rheostats
- Miscellaneous sensors and minor components hard mounted throughout the aircraft
- Busbars
- Lugs
- Ferrules
- Splices
- Connectors and electrical, electronic cables and looms
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA265A Remove and install general aircraft electrical hardware

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA265 Remove and install general aircraft electrical hardware

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using approved maintenance documentation and aircraft publications relating to miscellaneous aircraft electrical hardware and components
- recognising defects in and deterioration of electrical cables to aircraft industry standards, including crimped and soldered joints
- correctly interpreting aircraft wire markings, terminal block identification and plug/socket pin numbering systems
- inspecting electrical looms and harness pre and post-removal and installation to ensure minimum bends are maintained, cable is not in tension, plugs are correctly aligned, security of route ensures no chaffing of insulation, adequate clipping and cable ties have been utilised and construction complies with aircraft industry standards
- positive identification of miscellaneous electrical hardware and/or components in all aircraft systems
- plug connector pin removal and insertion.

It is essential that applicable cleanliness requirements and WHS precautions are fully observed, including awareness of electrostatic discharge procedures.

Evidence of transferability of skills and knowledge related to removal and installation is essential.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- relevant WHS procedures
- electrical wiring used in aircraft and wire marking
- plug/socket pin numbering and terminal block identification
- cable and loom installation requirements

- crimping tools and crimp terminals
- procedures for removal and insertion of plug connector pins
- electrical fundamentals and related mathematical and physics principles.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that applicable general-purpose tools, and test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision but without intervention on each of the following connection methods:
 - bolted
 - plug connectors
- and on a range of the hardware/components listed in the Range of Conditions:
 - switches, relays, lamps, terminal blocks, current limiters, circuit breakers, fuses, sockets, potentiometers, capacitors, inductors, magnetic amplifiers, transformers, rheostats, miscellaneous sensors and minor components hard mounted throughout the aircraft, busbars, lugs, ferrules, splices, connectors and electrical, electronic cables and looms.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.
-

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A266 Terminate and repair aircraft optical fibre cable

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and knowledge of aircraft optical fibre cable termination and repair methods in aircraft maintenance hangars and workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of all Avionic Certificate IV training pathways. The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element
1. Prepare to terminate or repair aircraft optical fibre cable	1.1 The system is isolated and it is confirmed that the optical source is not transmitting
	1.2 The requirement to terminate or replace an existing termination is confirmed from maintenance data
	1.3 The extent of damage is identified
	1.4 Equipment required for compliance with work health and safety (WHS) requirements is assembled and required personal protective equipment (PPE) is

			obtained and worn during termination and/or repair activities
		1.5	Required tools, optical connectors, materials and test equipment are assembled ready for use
2.	Terminate aircraft optical fibre cable	2.1	Optical fibre cable is prepared for termination in accordance with the applicable maintenance data or manufacturer's instructions
		2.2	The specified optical connector is fitted in accordance with relevant maintenance data or manufacturer's instructions
3.	Repair aircraft optical fibre cable	3.1	The extent of damage to the optical fibre cable is determined and assessed for repair or for cable replacement
		3.2	If damage is within specified limits the repair method is determined from the applicable maintenance data
		3.3	The repair is performed in accordance with the applicable repair method while observing all applicable WHS requirements
4.	Remove fibre hazards from work area	4.1	The work area is cleaned and all waste materials are packaged and disposed of in accordance with WHS requirements and enterprise procedures
5.	Test terminated and/or repaired optical fibre cable	5.1	Terminated and/or repaired fibre optic cable is tested for loss and strength of light transmission in accordance with maintenance data or manufacturer's specifications
		5.2	Optical fibre cable is connected to light transmitter and optical receiver

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Relevant specifications and maintenance data include:

- ARINC Specification 801 Fibre Optic Connectors
- ARINC Specification 802 Fibre Optic Cables
- ARINC Specification 805 Fibre Optic Test Procedures
- ARINC Specification 806 Fibre Optic Installation and Maintenance Procedures
- CASA AC21-99 Aircraft Wiring and Bonding, Section 2 Chapter 19

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

New unit of competency

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA266 Terminate and repair aircraft optical fibre cable

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- observing WHS procedures and selecting and correctly using PPE, including observance of laser safety procedures
- fitting optical connectors
- cleaning and polishing of optical connectors
- repairing optical fibre cable by splicing
- thorough clean-up of work area and correct packaging and disposal of waste
- testing of terminated and repaired optical fibre cables
- connecting optical fibre cable to the light transmitter and optical receiver.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- types of optical connector
- materials and procedures for cleaning and polishing optical connectors
- tools and materials used for fitting optical connectors
- optical fibre cable construction and characteristics, including:
 - strain relief and bend radius
 - cable installation precautions
- methods of splicing optical fibre cable
- light transmission methods and applications
- types of optical receiver
- test equipment:
 - calibrated light source and light receiver
 - power meter
 - optical time domain reflectometers
- cable inspection and testing
- AS/NZS 2211:2006 Safety of laser products (Parts 1 and 2)

- WHS procedures associated with optical fibre cable termination and repair, including laser safety procedures
- PPE required for optical fibre termination and repair
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in the applicable aircraft maintenance manuals. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Evidence of knowledge about optical fibre data transmission systems will be necessary to supplement evidence of ability to interpret requirements and terminate and repair optical fibre cable before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of tasks, including:
 - termination of optical fibre cable using a range of connector types
 - repair of optical fibre cable.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA270 Lay out avionic systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of basic knowledge of avionic system function, design and layout, including typical electrical and instrument systems, during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Lay out to block diagram level an aircraft electrical system	1.1 The functions of aircraft electrical systems are identified
	1.2 Aircraft electrical system components are identified

- | | | | |
|----|--|-----|--|
| | | 1.3 | A typical aircraft electrical system is sketched at block diagram level |
| | | 1.4 | Aircraft electrical system maintenance requirements are identified |
| 2. | Lay out to block diagram level an instrument measuring system | 2.1 | The various instrument measuring systems are identified |
| | | 2.2 | Measuring system components are identified |
| | | 2.3 | A typical instrument measuring system is sketched at block diagram level |
| | | 2.4 | Measuring system maintenance requirements are identified |
| 3. | Lay out to block diagram level a pressurisation control system | 3.1 | Pressurisation control system components are identified |
| | | 3.2 | A typical pressurisation control system is sketched at block diagram level |
| | | 3.2 | Pressurisation control system maintenance requirements are identified |
| 4. | Lay out to block diagram level an aircraft oxygen system | 4.1 | The various types of oxygen system are identified |
| | | 4.2 | Oxygen system components are identified |
| | | 4.3 | A typical oxygen system is sketched at block diagram level |
| | | 4.4 | Oxygen system maintenance requirements are identified |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Functions of aircraft electrical systems include:

- Power generation, control and distribution
- Lighting
- Electrically operated systems, such as doors, flap and landing gear systems
- System control (e.g. hydraulic, pneumatic, air conditioning, propeller control and anti-skid)
- Warning systems
- Ice and rain protection
- Engine systems

Aircraft electrical system components include:

- The major components of each of the above systems that would be shown in a block diagram or schematic

Instrument measuring systems include:

- Engine indication
- Transmitter/indicator measuring (pressure, temperature and position)
- Fuel quantity indication and flow indication

Measuring system components include:

- The major components of each of the above systems that would be shown in a block diagram or schematic

Pressurisation control system components include:

- The major components of a pressurisation control system that would be shown in a block diagram or schematic.

Types of oxygen system include:

- Gaseous
- Liquid
- Chemical

Oxygen system components include:

- The major components of each of the above systems that would be shown in a block diagram or schematic

Unit Mapping Information

Release 1 – equivalent to MEA270A Lay out avionic systems

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA270 Lay out avionic systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- sketching typical avionic systems at block diagram level.

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.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- DC and AC power generation, control and distribution
- aircraft electrical systems and their components
- aircraft electrical system maintenance requirements
- the atmosphere
- use of synchros and servos
- basics of analogue electronics
- aircraft instrument measuring systems and their components
- aircraft instrument measuring system maintenance requirements
- air conditioning and pressurisation systems
- air conditioning and pressurisation system maintenance requirements
- types of aircraft oxygen systems and their applications
- oxygen system maintenance requirements and related cleanliness and safety precautions.

Assessment Conditions

- This unit shall be assessed off the job in a training environment equipped to provide exposure to the range of system types and components. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.

- 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA271 Lay out avionic flight management systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of basic knowledge of avionic flight management systems function, design and layout including typical instrument, radio and electronic systems during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101 Interpret work health and safety practices in aviation maintenance

MEA107 Interpret and use aviation maintenance industry manuals and specifications

MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

MEA270 Lay out avionic systems

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Lay out to block diagram level a flight

1.1 The various aircraft flight instrument systems are identified

- | | | |
|---|-----|--|
| instrument system | 1.2 | Flight instrument system components are identified |
| | 1.3 | A typical advanced flight instrument system is sketched at block diagram level |
| | 1.4 | Flight instrument system maintenance requirements are identified |
| 2. Lay out to block diagram level an instrument navigation system | 2.1 | The various instrument navigation systems are identified |
| | 2.2 | Instrument navigation system components are identified |
| | 2.3 | A typical instrument navigation system is sketched at block diagram level |
| | 2.4 | Instrument navigation system maintenance requirements are identified |
| 3. Lay out to block diagram level an aircraft communication system | 3.1 | Aircraft communication systems are identified |
| | 3.2 | Communication system components are identified |
| | 3.3 | A typical communication system is sketched at block diagram level |
| | 3.4 | Communication systems maintenance requirements are identified |
| 4. Lay out to block diagram level an aircraft pulse system | 4.1 | Aircraft pulse systems are identified |
| | 4.2 | Pulse system components are identified |
| | 4.3 | A typical pulse system is sketched at block diagram level |
| | 4.4 | Pulse system maintenance requirements are identified |
| 5. Lay out to block diagram level an aircraft radio navigation system | 5.1 | Aircraft radio navigation systems are identified |
| | 5.2 | Radio navigation system components are identified |
| | 5.3 | A typical radio navigation system is sketched at block diagram level |
| | 5.4 | Radio navigation system maintenance requirements are |

- identified
6. Lay out to block diagram level an aircraft electronic system
- 6.1 Aircraft electronic systems are identified
- 6.2 Electronic system components are identified
- 6.3 A typical electronic system is sketched at block diagram level
- 6.4 Electronic system maintenance requirements are identified

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aircraft flight instrument systems include:

- Airspeed indication
- Pitot static systems
- Vertical speed indication
- Air data
- Machmeter
- Altimeters, including servo and encoding
- Angle of attack and stall warning/avoidance
- Turn and slip
- Directional gyros (DGs)
- Artificial horizons (AHs)
- Attitude heading reference

Flight instrument system components include:

- The major components of each of the above systems that would be shown in a block diagram or schematic

Instrument navigation systems include:

- Remote reading gyro compass
- Direct reading compass
- Ground proximity warning
- Flight data recording

- Inertial navigation
 - The major components of each of the above systems that would be shown in a block diagram or schematic
- Instrument navigation system components include:**
- Aircraft communication systems include:**
- High frequency (HF) radio
 - Very high frequency (VHF) radio
 - Ultra-high frequency (UHF) radio
 - Satellite communications
 - Communications addressing and reporting
 - Audio integration and intercommunications
 - Cockpit voice recording
 - Emergency location
- Communication system components include:**
- The major components of each of the above systems that would be shown in a block diagram
- Aircraft pulse systems include:**
- Navigation radar
 - Search radar
 - Weapons system radar
 - Radar altimeter
 - Air traffic control transponder
 - Distance measuring equipment
 - Tactical air navigation
 - Doppler
 - Collision avoidance
- Pulse system components include:**
- The major components of each of the above systems that would be shown in a block diagram
- Aircraft radio navigation systems include:**
- Instrument landing
 - Automatic direction finding
 - VHF omni range
 - Global navigation
- Radio navigation system components include:**
- The major components of each of the above systems that would be shown in a block diagram
- Aircraft electronic systems include:**
- Automatic flight control
 - Automatic engine control
 - Electronic instrument display
 - Flight management
- Electronic system components include:**
- The major components of each of the above systems that would be shown in a block diagram

Unit Mapping Information

Release 1 – equivalent to MEA271A Lay out avionic flight management systems

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA271 Lay out avionic flight management systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- sketching typical avionic flight management systems at block diagram level.

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.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the atmosphere
- pitot static systems
- magnetism
- function of gyroscopes
- use of synchros and servos
- basics of analogue electronics
- aircraft instrument systems and their components
- aircraft instrument system maintenance requirements
- radio, navigation and radar basics
- aircraft communication, pulse and radio navigation systems and their components
- communication, pulse and radio navigation system maintenance requirements
- basics of digital electronics
- basic computer architecture
- use of data buses
- automatic flight control systems and their components
- automatic engine control systems and their components
- flight management systems and their components
- display systems and their components
- aircraft electronic system maintenance requirements.

Assessment Conditions

- This unit may be assessed off the job in a training environment equipped to provide exposure to the range of system types and components. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA274 Maintain basic light aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the maintenance of basic aircraft electrical systems and components involving inspection, limited testing and troubleshooting, and component removal and installation during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include fixed wing aircraft with fixed undercarriage and basic rotary wing aircraft with skids or floats and no powered flight controls powered by either a normally aspirated piston engine or small gas turbine.

The unit is part of the small aircraft maintenance Certificate III and IV Mechatronics training pathways.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|---|
| 1. | Inspect basic aircraft electrical systems and components | 1.1 | Relevant maintenance documentation and modification status, including system defect reports where relevant, are used to identify specific inspection requirements |
| | | 1.2 | Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | | 1.3 | Direct current (DC) electrical system is visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | | 1.4 | Defects are correctly identified and reported |
| 2. | Test/adjust basic aircraft electrical systems | 2.1 | Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | | 2.2 | Electrical system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | | 2.3 | System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. | Troubleshoot basic aircraft electrical systems | 3.1 | Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | | 3.2 | Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | | 3.3 | Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | | 3.4 | System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, and in accordance with standard enterprise procedures |

- 3.5 Rectification requirements are determined
4. Remove and install basic aircraft electrical system components
- 4.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
- 4.2 Electrical component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements
- 4.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
- 4.4 Removed components are tagged and packaged in accordance with specified procedures
- 4.5 Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
- 4.6 Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out
- 4.7 System is reinstated to correct operational condition in preparation for testing, as necessary
- 4.8 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Applicable electrical systems include:

- DC power generation, regulation and distribution systems
- Piston engine and gas turbine engine ignition and starting systems (where applicable to the enterprise)
- DC electrical systems, such as flaps, including related motors and actuators
- Aircraft lighting
- Aircraft main battery

Applicable electrical components include:

- DC generators, and alternator/rectifier generators, and components of related single generator regulation and distribution systems
- Motors
- Actuators
- Piston engine and gas turbine engine ignition and starting system components
- Aircraft batteries
- Aircraft lighting components, such as bulbs, lenses, switches and rheostats

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA274A Maintain basic light aircraft electrical systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA274 Maintain basic light aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including those relating to gas turbine engine high energy ignition units
- using approved maintenance documentation and aircraft publications relating to DC electrical systems
- identifying/locating:
 - DC power generation, regulation, distribution and control systems and components:
 - generators and starter/generators
 - regulators
 - bus bars
 - circuit breakers and fuses
 - wiring
 - piston engine ignition and starting systems and components
 - magnetos or coils
 - starter motors
 - ignition switches/start switches
 - ignition harnesses
 - low tension wiring
 - spark plugs
 - auxiliary starting devices
 - gas turbine engine ignition and starting systems (where applicable to the enterprise):
 - starter motors and starter/generators
 - high energy ignition units
 - control units
 - switches
 - batteries and associated mounting equipment, including related anti-vibration aids
 - motors and actuators in basic DC electrical systems
- correctly connecting DC generators, alternator/rectifier generators and starter/generators

- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - DC power generation systems including regulation, distribution and control
 - battery installations
 - piston engine ignition and starting systems
 - gas turbine engine ignition and starting systems (where applicable to the enterprise)
 - internal/external lighting systems, including controls
 - motors and actuators in basic DC electrical systems
- applying logic processes, taking and interpreting electrical measurements, using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the electrical system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting and component removal and installation is essential. This is to be demonstrated through application across a range of aircraft electrical systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- DC electrical principles:
 - properties of permanent magnets
 - precautions for the care and storage of permanent magnets
 - properties of electromagnets
 - primary and secondary cells
 - aircraft battery types, construction, care and safety
 - resistor characteristics
 - fuses and circuit breakers
 - fundamental DC circuits
 - inductive circuits
 - capacitive circuits

- basic fault-finding principles
- general construction, operating characteristics and applications for aircraft:
 - DC generators
 - alternator/rectifier generators
 - DC motors including starter motors
 - starter/generators
 - DC actuators (linear and rotary)
 - gas turbine high energy ignition system components and related safety precautions
 - lighting systems
- the basic layout (block diagram level), function and operation of the systems listed in the Range of Conditions
- electrical system maintenance requirements and troubleshooting procedures
- relevant WHS practices, including those relating to gas turbine engine high energy ignition units
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on electrical looms, cables and connection hardware, and on each of the following systems and on at least one (1) major component/line replaceable unit (LRU) in each case:
 - DC power generation, regulation and distribution systems
 - piston engine and gas turbine engine ignition and starting systems (gas turbine may be omitted where not applicable to the enterprise)
 - DC electrical systems, such as flaps, including related motors and actuators
 - aircraft lighting
 - aircraft main battery (competency may be demonstrated through the performance of a battery check).
- Component removal and installation competencies are to be demonstrated on at least one (1) component from each of:

- DC generators, and alternator/rectifier generators, and components of related single generator regulation and distribution systems
- motors
- actuators
- piston engine and gas turbine engine ignition and starting system components (gas turbine may be omitted where not applicable to the enterprise)
- aircraft batteries
- aircraft lighting components such as bulbs, lenses, switches and rheostats .
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA275 Maintain basic light aircraft instrument systems and components

Modification History

Release 2 - Electronic flight instrument systems added to Range of Conditions

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable test equipment to inspect, test and troubleshoot basic aircraft instrument systems and to remove and install components during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include light fixed wing aircraft with fixed undercarriage and basic rotary wing aircraft with skids or floats and no powered flight controls powered by either a normally aspirated piston engine or small gas turbine.

The unit is part of the small aircraft maintenance Certificate III and IV Mechatronics training pathways.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Inspect basic aircraft instrument systems and components

- 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
- 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements
- 1.3 Instrument system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
- 1.4 Defects are correctly identified and reported

2. Test/adjust basic aircraft instrument systems and components

- 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
- 2.2 Instrument system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
- 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate

3. Troubleshoot basic aircraft instrument systems and components

- 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination
- 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level
- 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
- 3.4 Instrument system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in

- accordance with standard enterprise procedures
- 3.5 Rectification requirements are determined
4. Remove and install basic aircraft instrument system components
- 4.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety
- 4.2 Instrument component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements
- 4.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
- 4.4 Removed components are tagged and packaged in accordance with specified procedures
- 4.5 Instrument components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
- 4.6 Physical installation of instrument components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out
- 4.7 System is reinstated to correct operational condition in preparation for testing, as necessary
- 4.8 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Applicable instrument systems and components include:

- Pitot/static systems and components, airspeed indicators (ASI), vertical speed indicators (VSI), outside air temperature gauges (OAT) and counter-pointer altimeters
- Directional gyros (DGs) and artificial horizons (AHs) (air and electrically driven)
- Turn and bank and slip/turn coordinators
- Direct reading compasses
- Piston engine and gas turbine engine indication system components (direct reading measuring instruments and temperature indication)
- Electrical systems indication (voltage and current)
- Basic fuel quantity indication systems and components
- Vacuum indication components
- Electronic flight and engine instruments (where applicable to the enterprise)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 2 - electronic flight instrument systems added to Range of Conditions and Assessment Requirements. No change in outcome

Release 1 – equivalent to MEA275A Maintain basic light aircraft instrument systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA275 Maintain basic light aircraft instrument systems and components

Modification History

Release 2 - Electronic flight instrument systems added to Assessment Requirements

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using approved maintenance documentation and aircraft publications relating to basic instrument systems
- locating and identifying flight instrument system components comprising:
 - engine system temperature and speed, including mechanical and electrical tachometers
 - auxiliary direct reading systems, including vacuum, fuel storage quantities
 - flight systems, including attitude, altitude, air speed and OAT
- locating and identifying direct reading compasses
- correct handling and observance of maintenance precautions relating to gyroscopes, gimbals and pitot/static systems (connections, heating and protrusions)
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware, including cabling/harnesses, and security in:
 - flight instruments
 - pitot/static systems
 - direct reading compasses
 - piston engine and gas turbine engine indication systems
 - electrical systems indication
 - basic fuel quantity indication systems
 - vacuum indication systems
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying WHS requirements relevant to instrument system maintenance.

Where relevant to the enterprise:

- locating and identifying:
 - electronic flight instrument system (EFIS)

- engine indicating and crew alerting system (EICAS)
- electronic central aircraft monitoring (ECAM)
- data linkage and transmission systems
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses)
- interpreting the information presented on instrument display systems
- performing system functional tests and checks to confirm post-maintenance serviceability

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the instrument system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of basic aircraft instrument systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- handling precautions for electrostatic sensitive devices
- relevant WHS practices
- the basic layout (block diagram level), function and operation of the following systems as listed in the Range of Conditions:
 - pitot/static systems
 - piston engine and gas turbine engine direct reading indication systems
 - basic fuel quantity measurement systems
- the operating principles of the above systems and associated with:
 - atmospheric conditions; properties and effects on aircraft instruments and systems
 - pressure and temperature sensing elements and their use in aircraft instruments
 - gyroscopes and their use in aircraft instrument systems
 - electrical fundamentals
- instrument construction and operation:
 - instrument groupings, panel layout and construction
 - pitot static instruments (ASI, VSI and counter-pointer altimeters), their operation, calibration, safe handling and related terminology
 - pitot pressure
 - static pressure
 - altimeter Q code settings:

- QNH
- QNE
- QFE
- indicated airspeed (IAS)
- true airspeed (TAS)
- vacuum system indication component construction and operation
- air and electrically powered artificial horizon construction and operation
- DG construction and operation
- construction and operation of direct reading engine instruments
- turn and bank and slip/turn coordinator construction and operation
- direct reading compass construction and compass calibration
- piston and gas turbine engine direct reading measuring instruments and temperature indication instruments construction and operation
- voltage and current measuring instrument construction and operation
- volumetric fluid quantity system components, construction and operation
- instrument system maintenance requirements and troubleshooting procedures, including pitot/static system leak testing
- relevant maintenance documentation and maintenance publications
- relevant regulatory requirements and standard procedures
- for electronic flight and engine instrument systems:
 - the layout and operation (to block diagram level) of EFIS, EICAS and ECAM systems and related data linkage and transmission systems
 - interpretation of display data
 - component removal and installation procedures
 - testing of system operation using on-board testing procedures and/or simple external test equipment with a go or no go outcome
 - software management control requirements.
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Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least one major system component/line replaceable unit (LRU) from each of the following groups:
 - pitot/static systems and components, ASI, VSI and counter-pointer altimeters
 - DGs and AHs (air and electrically driven)
 - turn and bank and slip/turn coordinators
 - direct reading compasses
 - piston engine and gas turbine engine indication system components (direct reading measuring instruments and temperature indication)
 - electronic flight and engine instrument system components (may be omitted if not relevant to the enterprise)
 - electrical systems indication (voltage and current)
 - basic fuel quantity indication systems and components
 - vacuum indication components.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA276 Maintain basic aircraft communication and radio navigation systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, functionally test and troubleshoot basic communication and radio navigation systems and to remove and install components during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include communication and radio navigation systems of fixed wing aircraft with fixed undercarriage and basic rotary wing aircraft with skids or floats and no powered flight controls powered by either a normally aspirated piston engine or small gas turbine.

The unit is part of the small aircraft maintenance Certificate III and IV Mechatronics training pathways.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Inspect basic communication and radio navigation systems and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Communication and radio navigation systems and components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual |
| | 1.4 Defects are correctly identified and reported |
| 2. Functionally test basic communication and radio navigation systems and components | 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Communication and radio navigation systems are functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | 2.3 Deficiencies are correctly identified and reported |
| 3. Troubleshoot basic communication and radio navigation systems | 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 Communication and radio navigation system faults are located and are correctly recorded in maintenance documentation in accordance with standard operating |

- procedures
4. Remove and install basic radio communication and navigation system components
- 4.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
 - 4.2 Communication and navigation system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements
 - 4.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 4.4 Removed components are tagged and packaged in accordance with specified procedures
 - 4.5 Communication and navigation system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
 - 4.6 Physical installation of components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out
 - 4.7 System is reinstated to correct operational condition in preparation for testing, as necessary
 - 4.8 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Applicable communication and radio navigation systems and components include:

- High frequency (HF) and very high frequency (VHF) communication line replaceable units (LRUs), transmission lines and antennas
- Automatic direction finding (ADF), very high frequency omni-directional range (VOR) and global navigation system (GNS) navigation system LRUs, transmission lines and antennas
- Air traffic control (ATC) transponders, transmission lines and antennas
- Automatic dependent surveillance-broadcast (ADS-B)
- Emergency location transmitter (ELT)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA276A Maintain basic aircraft communication and radio navigation systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA276 Maintain basic aircraft communication and radio navigation systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the radio frequency and communications system being maintained
- locating and identifying radio communication and navigation system components comprising:
 - HF and VHF communications
 - VOR, ADF and GNS
 - ATC transponders
 - ADS-B
 - ELT systems
- locating and identifying applicable radio system antennas
- recognition of system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in:
 - HF and VHF communications systems
 - VOR, ADF and GNS
 - ATC transponders
 - ADS-B
 - ELT systems
- applying logic processes, functional testing and visual inspections to isolate malfunctions within the above systems
- functionally testing listed systems to assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the basic communication or radio navigation system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, functional testing and visual troubleshooting is essential. This is to be demonstrated through application across a range of basic aircraft communication and radio navigation systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- printed circuit boards
- semiconductors
- fibre optics
- handling precautions for electrostatic sensitive devices
- relevant WHS practices
- the use of approved maintenance documentation and aircraft publications relating to radio communication and navigation systems and components
- the general working principles of communication and navigation systems
- explaining the basic system layout (block diagram level), function and operation of:
 - HF and VHF communications systems
 - VOR, ADF and GNS navigation systems
 - ATC transponders
 - ELT systems
 - ADS-B systems
- radio frequency and communication system maintenance requirements and basic troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least one (1) major system component/LRU from each of the following groups:
 - HF and VHF communication LRUs, transmission lines and antennas
 - ADF, VOR and GNS navigation system LRUs, transmission lines and antennas
 - ATC transponders, transmission lines and antennas
 - ELT
 - ADS-B.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA277 Maintain twin engine aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency extends the competencies developed in units MEA202 Remove and install basic aircraft electrical system components and MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components to include the maintenance of additional electrical systems found in twin piston engine fixed wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the small aircraft maintenance Certificate IV Mechatronics training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA210 Inspect, test and troubleshoot basic aircraft electrical systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Inspect twin engine aircraft electrical systems and components
 - 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
 - 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements
 - 1.3 Direct current (DC) electrical system is visually or physically checked for external signs of defects in accordance with applicable maintenance manual
 - 1.4 Defects are correctly identified and reported
2. Test/adjust twin engine aircraft electrical systems
 - 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
 - 2.2 Electrical system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
 - 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot twin engine aircraft electrical systems
 - 3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
 - 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level
 - 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
 - 3.4 System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, and in accordance with standard enterprise procedures
 - 3.5 Rectification requirements are determined
4. Remove and install twin engine aircraft electrical system components
 - 4.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety

- 4.2 Electrical component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements
- 4.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
- 4.4 Removed components are tagged and packaged in accordance with specified procedures
- 4.5 Electrical components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
- 4.6 Physical installation of electrical components is performed in accordance with the applicable maintenance manual, ensuring appropriate adjustment/alignment with mechanical interface is carried out
- 4.7 System is reinstated to correct operational condition in preparation for testing, as necessary
- 4.8 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

DC electrical systems include:

- DC multi-generator and alternator/rectifier generator regulation and distribution systems and components
- Electrical propeller control systems, such as feathering systems (where applicable to the enterprise)
- Batteries in dual battery installations and associated

- mounting equipment, including related anti-vibration aids
- Fire warning and extinguishing systems, including handling of halogen fire extinguishers (where applicable to the enterprise)
 - Combustion heating systems (where applicable to the enterprise)
 - Equipment cooling and ventilation
 - Fuel storage and distribution systems
 - Master and central warning systems (where applicable to the enterprise)
- Electrical components include:**
- Components of multi-generator regulation and distribution systems
 - Electrical propeller control system components (where applicable to the enterprise)
 - Batteries in dual battery installations and associated mounting equipment, including related anti-vibration aids
 - Fire warning and extinguishing system components (where applicable to the enterprise)
 - Combustion heaters and associated components (where applicable to the enterprise)
 - Equipment cooling and ventilation components
 - Fuel storage and distribution system electrical components
 - Master and central warning system components (where applicable to the enterprise)
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA277A Maintain twin engine aircraft electrical systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA277 Maintain twin engine aircraft electrical systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to twin engine aircraft electrical systems
- identifying/locating:
 - DC multi-generator power generation, regulation, distribution and control systems and components, i.e. regulators and bus bars
 - electrical propeller control systems and components, such as feathering and synchronising systems
 - batteries in dual battery installations and associated mounting equipment, including related anti-vibration aids
 - fire warning and extinguishing systems and components
 - identification of halogen (e.g. BCF) fire extinguishers
 - combustion heating systems
 - equipment cooling and ventilation
 - fuel storage and distribution system electrical components
 - master and central warning systems
- correctly connecting DC generators and alternator/rectifier generators in multi-generator systems and paralleling generator output
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in the above systems and system components
- applying logic processes, taking and interpreting electrical measurements, using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the electrical system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting and component removal and installation is essential. This is to be demonstrated through application across a range of aircraft electrical systems and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- system testing procedures and paralleling of generator output
- the basic layout (block diagram level), function and operation of:
 - DC multi-generator and alternator/rectifier generator regulation and distribution systems and components
 - electrical propeller control systems, such as feathering and synchronising systems and system components
 - dual battery systems and associated mounting equipment, including related anti-vibration aids
 - fire warning and extinguishing systems and system components, including regulatory requirements relating to halogen (e.g. BCF) fire extinguishers
 - combustion heating systems and system components
 - equipment cooling and ventilation systems and system components
 - fuel storage and distribution systems and system components
 - master and central warning systems and system components
- maintenance requirements and troubleshooting procedures for the above electrical systems
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.

- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on electrical looms, cables and connection hardware, and on each following system and on at least one (1) major component/line replaceable unit (LRU) in each case:
 - DC multi-generator and alternator/rectifier generator regulation and distribution systems and components
 - electrical propeller control systems, such as feathering systems (where applicable to the enterprise)
 - batteries in dual battery installations and associated mounting equipment, including related anti-vibration aids (competency may be demonstrated through the performance of a battery check)
 - fire warning and extinguishing systems, including handling of halogen fire extinguishers (where applicable to the enterprise)
 - combustion heating systems (where applicable to the enterprise)
 - equipment cooling and ventilation
 - fuel storage and distribution systems
 - master and central warning systems (where applicable to the enterprise).
- Component removal and installation competencies are to be demonstrated on at least one (1) component from each of the following groups:
 - components of multi-generator regulation and distribution systems
 - electrical propeller control system components (where applicable to the enterprise)
 - batteries in dual battery installations and associated mounting equipment, including related anti-vibration aids
 - fire warning and extinguishing system components (where applicable to the enterprise)
 - combustion heaters and associated components (where applicable to the enterprise)
 - equipment cooling and ventilation components
 - fuel storage and distribution system electrical components
 - master and central warning system components (where applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA278 Inspect, test and troubleshoot instrument display systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot electronic instrument display systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the small aircraft maintenance Certificate IV Mechatronics and the Avionic Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA207 Remove and install aircraft electronic system components

MEA246 Fabricate and/or repair aircraft electrical hardware or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Inspect electronic aircraft instrument display systems and components | <p>1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements</p> <p>1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements</p> <p>1.3 Electronic instrument display system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual</p> <p>1.4 Defects are correctly identified and reported</p> |
| 2. Test/adjust electronic aircraft instrument display systems and components | <p>2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation</p> <p>2.2 Electronic instrument display system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction</p> <p>2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate</p> |
| 3. Troubleshoot electronic aircraft instrument display systems | <p>3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination</p> <p>3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level</p> <p>3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process</p> <p>3.4 Electronic instrument display system faults are located</p> |

and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures

3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Electronic instrument display systems include:

- Electronic flight instrument system (EFIS)
- Engine indicating and crew alerting system (EICAS)
- Electronic central aircraft monitoring (ECAM)
- Head-up display (HUD) (where applicable to the enterprise)
- Data linkage and transmission systems

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA278A Inspect, test and troubleshoot instrument display systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA278 Inspect, test and troubleshoot instrument display systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of instrument display systems and data transmission and linkage systems
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) for the range of systems listed in the Range of Conditions
- interpreting the information presented on instrument display systems
- applying logic processes and using appropriate wiring diagrams and manuals to isolate instrument display system malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- applying standard procedures
- observing all relevant WHS procedures.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the instrument display system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This may be demonstrated through application across a range of aircraft instrument and display systems (where display systems are applicable to the enterprise) listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool and test equipment usage and installation/securing of system components

- the basic layout (block diagram level) of the systems listed in the Range of Conditions
- the operating principles of the systems listed in the Range of Conditions and associated with:
 - electrical and instrument fundamentals relating to multi-function display systems
 - interpretation of display information and display screen symbol generation
 - the operation of each listed system and system components
- WHS procedures relating to instrument display systems and components
- relevant Aeronautical Radio Incorporated (ARINC) specifications (avionic data bus)
- relevant maintenance manuals
- maintenance requirements and troubleshooting procedures
- relevant regulatory requirements and standard procedures, including software management control.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on a system and on at least one (1) major system component of each of the following:
 - EFIS
 - EICAS
 - ECAM
 - Data linkage and transmission systems
 - HUD (may be omitted if not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA279 Inspect, test and troubleshoot full authority digital engine control systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications and test sets in the inspection, testing and troubleshooting of full authority digital engine control (FADEC) systems of fixed and rotary wing aircraft scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) and small aircraft maintenance Certificate IV (Mechatronic) training pathways.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

- | | |
|--------|---|
| MEA207 | Remove and install aircraft electronic system components |
| MEA246 | Fabricate and/or repair aircraft electrical hardware or parts |

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
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1. Inspect FADEC systems and components
 - 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
 - 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual
 - 1.3 FADEC system is visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements
 - 1.4 Defects are correctly identified and reported
2. Test FADEC systems
 - 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
 - 2.2 FADEC system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
3. Troubleshoot FADEC systems
 - 3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
 - 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting using test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
 - 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
 - 3.4 System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, and in accordance with standard enterprise procedures
 - 3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- FADEC systems include:**
- Computers, sensors, interfaces, cockpit controls, data cables and wiring looms that comprise the electronic control system
 - Other engine-mounted related components, such as spark plugs, ignition units, injectors and fuel control units are covered by the applicable engine maintenance units (e.g. MEA313 Inspect, test and troubleshoot piston engine systems and components, MEA314 Inspect, test and troubleshoot gas turbine engine systems and components or MEA353 Maintain basic light aircraft engines and propellers)
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA279A Inspect, test and troubleshoot full authority digital engine control systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA279 Inspect, test and troubleshoot full authority digital engine control systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including those relating to engine ground running
- using approved maintenance documentation and aircraft publications relating to the applicable FADEC system
- using test sets to download maintenance data from the FADEC system and interpreting the data
- identifying/locating airframe and engine, including propeller/rotor-mounted FADEC system components
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in airframe and engine-mounted FADEC system components
- correctly handling electrostatic sensitive devices
- applying logic processes, using test equipment and appropriate wiring diagrams and manuals to isolate FADEC system malfunctions
- using built-in test features to confirm post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the FADEC system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting and component removal and installation is essential. This is to be demonstrated through application on FADEC systems and components as defined in the Range of Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs

- digital electronic theory
- open and closed loop control
- the basic layout (block diagram level), function and operation of FADEC systems
- architecture of FADEC system computers, software and software management
- operation of sensors that input data to FADEC system computers
- built-in test system operation and downloading and interpretation of system data
- relevant regulatory requirements and standard procedures, including software management control
- maintenance requirements and troubleshooting procedures
- relevant maintenance manuals.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on FADEC systems and system components as follows:
 - computers, sensors, interfaces, cockpit controls, data cables and wiring looms that comprise the electronic control system
- Other engine-mounted related components, such as spark plugs, ignition units, injectors and fuel control units are covered by the applicable engine maintenance units (e.g. MEA313 Inspect, test and troubleshoot piston engine systems and components, MEA314 Inspect, test and troubleshoot gas turbine engine systems and components or MEA353 Maintain basic light aircraft engines and propellers) and should not be assessed as part of this unit.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA280 Inspect, test and troubleshoot flight management systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot flight management system computers, control display units, database units and the interface with flight control and navigation systems during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include fixed and rotary wing aircraft that have flight management systems.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA207	Remove and install aircraft electronic system components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

- essential outcomes. demonstrate achievement of the element.
1. Inspect flight management systems and components
 - 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
 - 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements
 - 1.3 Flight management system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
 - 1.4 Defects are correctly identified and reported
 2. Test flight management systems and components
 - 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
 - 2.2 Flight management system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
 3. Troubleshoot flight management systems
 - 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination
 - 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting using test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level
 - 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
 - 3.4 Flight management system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
 - 3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Flight management systems include:**
- Flight management computer
 - Control display unit
 - Database unit
 - Global positioning system (GPS) sensor (where applicable to the enterprise)
 - GPS antenna (where applicable to the enterprise)
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA280A Inspect, test and troubleshoot flight management systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA280 Inspect, test and troubleshoot flight management systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills, tools and test equipment in the testing and troubleshooting of flight management systems
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) for the system components listed in the Range of Conditions
- interpreting the information presented on control display units
- applying logic processes and using appropriate wiring diagrams and manuals to isolate flight management system malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- applying standard procedures
- observing all relevant WHS procedures.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the flight management system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

This may be demonstrated through application across the components of a flight management system as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool and test equipment usage and installation/securing of system components
- electrical principles and digital electronic theory

- the basic layout (block diagram level) of flight management systems
- the operating principles of flight management computers, control display units and database units, including the interface with flight control, engine control and navigation systems
- the interface with Aircraft Communication Addressing and Reporting System and relevant Aeronautical Radio Incorporated (ARINC) specifications (avionic data bus)
- the operation of integral GPS sensors
- WHS procedures relating to flight management systems and components
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including software management control
- maintenance requirements and troubleshooting procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards, including software management control.
- Where the flight management system includes integral GPS, consideration may be given to concurrent assessment of MEA234 Inspect, test and troubleshoot aircraft global navigation systems and components.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on a system and on at least one (1) major system component of each of:
 - flight management computer
 - control display unit
 - database unit
 - GPS sensor (may be omitted if not applicable to enterprise)
 - GPS antenna (may be omitted if not applicable to enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA281 Maintain light aircraft AC powered instrument systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable test equipment to inspect, test and troubleshoot alternating current (AC) powered aircraft instrument systems, including the power supply, and to remove and install components during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include light fixed wing and rotary wing aircraft with piston or turbine engines.

The unit is part of the small aircraft maintenance Certificate IV (Mechatronics) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.	demonstrate achievement of the element.
1. Inspect light aircraft AC instrument systems, power supplies and components	<p>1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements</p> <p>1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual</p> <p>1.3 AC instrument system and AC power supply components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements</p> <p>1.4 Defects are correctly identified and reported</p>
2. Test/adjust light aircraft AC instrument systems, power supplies and components	<p>2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation</p> <p>2.2 Instrument system and AC power supply is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction</p> <p>2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate</p>
3. Troubleshoot light aircraft AC instrument systems, power supplies and components	<p>3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination</p> <p>3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting, using test sets, downloaded maintenance data and fault-finding charts or similar, to line replacement level</p> <p>3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process</p> <p>3.4 Instrument system or power supply faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise</p>

- procedures
- 3.5 Rectification requirements are determined
4. Remove and install light aircraft AC instrument system, and power supply components
- 4.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
- 4.2 Instrument or power supply component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements
- 4.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
- 4.4 Removed components are tagged and packaged in accordance with specified procedures
- 4.5 Instrument or power supply components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
- 4.6 Physical installation of instrument or power supply components is performed in accordance with the applicable maintenance manual and regulatory requirements, ensuring appropriate adjustment/alignment is carried out
- 4.7 System is reinstated to correct operational condition in preparation for testing, as necessary
- 4.8 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

AC instrument systems and AC power supply components include:

- Directional gyro (DG), artificial horizon (AH), attitude heading and reference system (AHRS) and components, servo and encoding altimeters, and remote reading gyro compasses and components
- Piston engine and gas turbine engine indication system components
- Fuel quantity indication and flow indication systems and components
- Transmitter/indicator measuring instrument systems (pressure, temperature and vacuum) and components
- Inverters and transformer/rectifier units
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA281A Maintain light aircraft AC powered instrument systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA281 Maintain light aircraft AC powered instrument systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- using approved maintenance documentation and aircraft publications relating to AC instrument systems and related AC power supplies
- locating and identifying AC powered instrument system components including:
 - AH, DG, AHRS, servo and encoding altimeters
 - engine system temperature, speed, oil pressure, torque and manifold pressure
 - auxiliary systems, including vacuum, fuel storage quantities and fuel flow
 - remote reading gyro compasses
- locating and identifying AC instrument power supply system components, including:
 - inverters
 - transformer/rectifier units
 - voltage and frequency indication
- correctly handling and observing maintenance precautions for gyroscopes and gimbals
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in AC powered instruments and related power supply, including:
 - flight instruments
 - remote reading gyro compasses
 - piston engine and gas turbine engine indication systems (indicators and transmitters/sensors)
 - fuel quantity and flow indication systems (indicators, probes and transmitters)
 - transmitter/indicator measuring instrument systems (pressure, temperature and vacuum)
 - AC power supply, including inverters and transformer/rectifier units
- applying logic processes, taking and interpreting system measurements, using test equipment and appropriate wiring diagrams and manuals to isolate malfunctions in the above systems
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- applying WHS requirements relevant to instrument and electrical system maintenance.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across a range of AC powered aircraft instrument systems, AC power supplies and components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware and plugs
- handling precautions for electrostatic sensitive devices
- relevant WHS practices
- AC theory:
 - calculations and measurement in AC circuits
 - inductors and inductive reactance
 - transformer operation
 - capacitors and capacitive reactance
 - LCR circuits and resonance
 - passive filters
 - power relationship in reactive circuits
- the basic layout (block diagram level), function and operation of AC powered:
 - flight instruments
 - remote reading gyro compasses
 - piston engine and gas turbine engine indication systems (indicators and transmitters/sensors)
 - fuel quantity and flow indication systems (indicators, probes and transmitters)
 - transmitter/indicator measuring instrument systems (pressure, temperature and vacuum)
 - AC power supply including AC generators, inverters and transformer/rectifier units
- the operating principles of the above systems and associated with:
 - atmospheric conditions – properties and effects on aircraft instruments and systems
 - pressure and temperature sensing elements and their use in aircraft instrument systems
 - gyroscopes and their use in aircraft instrument systems
 - electrical fundamentals
- relevant maintenance documentation and maintenance publications

- maintenance requirements and troubleshooting procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least one (1) major system component/line replaceable unit (LRU) from each of the following groups:
 - DG, AH, AHRS and components, servo and encoding altimeters, remote reading gyro compasses and components
 - piston engine and gas turbine engine indication system components
 - fuel quantity indication and flow indication systems and components
 - transmitter/indicator measuring instrument systems (pressure, temperature, vacuum) and components
 - inverters and transformer/rectifier units.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA282 Repair or overhaul aircraft pulse system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, test equipment and knowledge of pulse, analogue and digital theory to repair or overhaul components from fixed and rotary wing aircraft pulse systems that are repaired or overhauled in aviation maintenance workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway.

Repair of circuit boards is covered by MEA262 Modify/repair single layer printed circuit boards and MEA263 Modify/repair multi-layer printed circuit boards.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA260 Use electrical test equipment

MEA261 Use electronic test equipment

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Determine requirements
 - 1.1 Pulse system component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
 - 1.2 Circuitry is correctly prepared and connected to the applicable test equipment and is functionally tested or cycled through the prescribed test procedures in accordance with the maintenance documentation for evidence of serviceability or malfunction
 - 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components
 - 1.4 Extent of overhaul or repair is correctly identified and documented
2. Troubleshoot pulse system components
 - 2.1 Available information from maintenance records and inspection and test results is used, where necessary, to assist in fault determination
 - 2.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting
 - 2.3 Faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
 - 2.4 Fault rectification requirements are determined
3. Dismantle and inspect pulse system components
 - 3.1 Component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements
 - 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
 - 3.3 Parts requiring specialist repair are tagged and repair instructions are accurately specified
 - 3.4 Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify pulse system components
 - 4.1 Component parts are repaired or replaced in accordance with the relevant maintenance documentation

- | | | | | | | | | |
|-----|---|--|-----|---|-----|---|-----|---|
| | 4.2 | Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures | | | | | | |
| 5. | Assemble, test and adjust pulse system components | <table border="0"> <tr> <td>5.1</td> <td>Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents</td> </tr> <tr> <td>5.2</td> <td>Assembled components are tested and adjusted/aligned in accordance with the applicable maintenance documentation using the appropriate test equipment</td> </tr> <tr> <td>5.3</td> <td>Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures</td> </tr> </table> | 5.1 | Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents | 5.2 | Assembled components are tested and adjusted/aligned in accordance with the applicable maintenance documentation using the appropriate test equipment | 5.3 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures |
| 5.1 | Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents | | | | | | | |
| 5.2 | Assembled components are tested and adjusted/aligned in accordance with the applicable maintenance documentation using the appropriate test equipment | | | | | | | |
| 5.3 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures | | | | | | | |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Pulse system components include:

- Weather radar, search radar and weapons system radar
- Distance measuring equipment (DME) and tactical aerial navigation (TACAN)
- Doppler navigation
- Air traffic transponder
- Radio altimeter
- Airborne collision avoidance system (ACAS)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA282A Repair or overhaul aircraft pulse system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA282 Repair or overhaul aircraft pulse system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved repair/overhaul manuals, procedures and processes relating to pulse system components
- recognising the serviceability state and repair or overhaul requirements for pulse system components
- applying logic processes, using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly aligning components listed above to operate within prescribed specifications.

It is essential that system testing and aligning procedures, cleanliness requirements and safety precautions applicable to the pulse system components being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing, alignment and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to testing, aligning and troubleshooting is essential. This may be demonstrated through application across a representative range of the components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component and system operation
- the basic function and operation of components of pulse systems to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements and serviceability status post-repair or overhaul
- basic principles/functions relating to pulse system components and associated with:

- advanced analogue fundamentals
- digital fundamentals
- AC and DC electrical systems
- electromagnetic radiation
- antenna and transmission line (including waveguide) characteristics
- pulsed radar system operation.

Assessment Conditions

- Competency should be assessed in the work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special-purpose tools and test equipment would be used where appropriate.
- The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated.
- Assessment should be made across a sufficient number of components to establish the ability to apply attained skills and knowledge across the full range of pulse system components with the aid of applicable maintenance manuals and data.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of components from two (2) or more of the following groups:
 - weather radar, search radar and weapons system radar
 - DME and TACAN
 - doppler navigation
 - air traffic transponder
 - radio altimeter
 - ACAS.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA283 Repair or overhaul aircraft display, control and distribution system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, test equipment and knowledge of pulse, analogue and digital theory to repair or overhaul pulse system components from aircraft control and distribution systems during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include control and distribution system components from fixed and rotary wing aircraft that are repaired or overhauled in aviation maintenance workshops.

The unit is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway.

Repair of circuit boards is covered by MEA262 Modify/repair aircraft component single layer printed circuit boards and MEA263 Modify/repair aircraft component multi-layer printed circuit boards.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA260 Use electrical test equipment

MEA261 Use electronic test equipment

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|--|---|
| 1. Determine requirements | 1.1 Display, control and distribution system component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 Circuitry is correctly prepared and connected to the applicable test equipment and is functionally tested or cycled through the prescribed test procedures in accordance with the maintenance documentation for evidence of serviceability or malfunction |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is correctly identified and documented |
| 2. Troubleshoot display, control and distribution system components | 2.1 Available information from maintenance records and inspection and test results is used, where necessary, to assist in fault determination |
| | 2.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting |
| | 2.3 Faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required |
| | 2.4 Fault rectification requirements are determined |
| 3. Dismantle and inspect display, control and distribution system components | 3.1 Component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements |
| | 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |
| | 3.3 Parts requiring specialist repair are tagged and repair instructions are accurately specified |

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| | | 3.4 | Parts lists are compiled and processed in accordance with standard enterprise procedures |
| 4. | Repair and/or modify display, control and distribution system components | 4.1 | Component parts are repaired or replaced in accordance with the relevant maintenance documentation |
| | | 4.2 | Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures |
| 5. | Assemble, test and adjust display, control and distribution system components | 5.1 | Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents |
| | | 5.2 | Assembled components are tested and adjusted/aligned in accordance with the applicable maintenance documentation using the appropriate test equipment |
| | | 5.3 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Display, control and distribution system components

- Display, control and distribution system components are from any or all of the following aircraft systems:
 - display systems, including electronic flight instrument systems (EFIS), engine indicating and crew alerting system (EICAS) and electronic central aircraft monitoring (ECAM)
 - automatic flight control system (AFCS)
 - autopilots (digital and analogue)
 - flight director (digital and analogue)
 - flight management

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA283A Repair or overhaul aircraft display, control and distribution system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA283 Repair or overhaul aircraft display, control and distribution system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved repair/overhaul manuals, procedures and processes relating to aircraft display, control and distribution system components
- recognising the serviceability state and repair or overhaul requirements for components from:
 - digital electronic instruments/display systems
 - digital flight controllers and directors
 - digital AFCS/autopilot systems
 - flight management systems
 - analogue components of control and distribution systems
- applying logic processes, using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly aligning components listed above to operate within prescribed specifications
- correctly interpreting digital instrument display indications, information and symbols.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the display, control and distribution system components being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing, alignment and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to testing, aligning and troubleshooting is essential. This may be demonstrated through application across a representative range of the components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component and system operation
- the basic function and operation of components as follows to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post-repair or overhaul:
 - digital electronic instruments/display system components
 - digital flight controllers and directors
 - digital AFCS/autopilot system components
 - flight management system components
 - analogue components of control and distribution systems
- basic principles/functions, relating to the above systems/components and associated with:
 - advanced analogue fundamentals, including video display generation techniques
 - digital fundamentals
- alternating current (AC) and direct current (DC) electrical systems.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special-purpose tools and test equipment would be used where appropriate.
- The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated.
- Assessment should be made across a sufficient number of components to establish the ability to apply attained skills and knowledge across the full range of display, control and distribution system components with the aid of applicable maintenance manuals and data.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of components, that are applicable to the enterprise, from the following systems:
 - display systems, including EFIS, EICAS and ECAM
 - AFCS
 - autopilots (digital and analogue)
 - flight director (digital and analogue)

- flight management.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA284 Repair or overhaul aircraft instrument system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and knowledge of component repair and overhaul procedures relating to fixed and rotary wing aircraft instrument system components that are repaired or overhauled in aviation maintenance workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway.

Repair of circuit boards is covered by MEA262 Modify/repair aircraft component single layer printed circuit boards and MEA263 Modify/repair aircraft multi-layer printed circuit boards.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA260	Use electrical test equipment
MEA261	Use electronic test equipment

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Determine requirements | 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 System components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is correctly identified and documented |
| 2. Troubleshoot instrument system components | 2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | 2.2 Logical processes are used to ensure efficient and accurate troubleshooting |
| | 2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |
| | 2.4 System component faults are located and the causes of the faults are clearly identified |
| | 2.5 Fault rectification requirements are determined to assist in planning the repair |
| 3. Dismantle and inspect instrument system components | 3.1 System component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements |
| | 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |
| | 3.3 Parts requiring specialist repair are tagged and repair instructions are accurately specified |

- | | | |
|---|-----|---|
| | 3.4 | Parts lists are compiled and processed in accordance with standard enterprise procedures |
| 4. Repair and/or modify instrument system components | 4.1 | System component parts are repaired or replaced in accordance with the relevant maintenance documentation |
| | 4.2 | Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures |
| 5. Assemble, test and adjust instrument system components | 5.1 | Assembly of component parts is carried out within specified tolerances and in accordance with the appropriate maintenance documents |
| | 5.2 | System components are adjusted or calibrated to operate within prescribed specifications |
| | 5.3 | Finished components are tagged, sealed and packaged in accordance with specified procedures |
| | 5.4 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

System components include:

- General instrument components, including mechanical instruments, electro-mechanical instruments and sensors

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA284A Repair or overhaul aircraft instrument system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA284 Repair or overhaul aircraft instrument system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved repair/overhaul procedures and processes relating to instrument system components
- recognising the serviceability state and repair or overhaul requirements for:
 - mechanical instruments
 - electro-mechanical instruments
 - instrument sensors
- applying logic processes, and using test equipment and appropriate wiring diagrams and manuals to isolate components faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly disassembling, inspecting component parts, repairing/ replacing/modifying component parts and assembling components listed above
- correctly interpreting instrument and display information, symbols and readings.

It is essential that system component testing procedures, cleanliness requirements and safety precautions applicable to the instrument system components being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a representative range from within the components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component and system operation

- the basic function and operation of the following components to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post-repair or overhaul:
 - mechanical instruments
 - electro-mechanical instruments
 - instrument sensors
- basic principles/functions relating to the above components and associated with:
 - alternating current (AC) and direct current (DC) synchronous systems
 - servomechanisms
 - gyroscopes
 - vacuum and pressure-based indication methods (pitot/static and pressurisation)
 - advanced analogue fundamentals
- electro-mechanical sensor signal generation.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special-purpose tools and test equipment would be used where appropriate.
- Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of general instrument components, including:
 - mechanical instruments, electro-mechanical instruments and sensors
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA285 Repair or overhaul aircraft radio frequency communication and navigation system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, test equipment and knowledge of analogue and digital theory to repair or overhaul radio frequency (RF) components from aircraft communication and navigation systems.

Applications include RF communications and navigation system components from fixed and rotary wing aircraft that are repaired or overhauled in aviation maintenance workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway.

Repair of circuit boards is covered by MEA262 Modify/repair aircraft component single layer printed circuit boards and MEA263 Modify/repair aircraft component multi-layer printed circuit boards.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA260 Use electrical test equipment

MEA261 Use electronic test equipment

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Determine requirements | 1.1 Communication and navigation system component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 Circuitry is correctly prepared and connected to the applicable test equipment and is functionally tested or cycled through the prescribed test procedures in accordance with the maintenance documentation for evidence of serviceability or malfunction |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is correctly identified and documented |
| 2. Troubleshoot RF communication and navigation system components | 2.1 Available information from maintenance records and inspection and test results is used, where necessary, to assist in fault determination |
| | 2.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting |
| | 2.3 Faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required |
| | 2.4 Fault rectification requirements are determined |
| 3. Dismantle and inspect RF communication and navigation system components | 3.1 Component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements |
| | 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |

- 3.3 Parts requiring specialist repair are tagged and repair instructions are accurately specified
 - 3.4 Parts lists are compiled and processed in accordance with standard enterprise procedures
 4. Repair and/or modify RF communication and navigation system components
 - 4.1 Component parts are repaired or replaced in accordance with the relevant maintenance documentation
 - 4.2 Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures
 5. Assemble, test and adjust RF communication and navigation system components
 - 5.1 Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents
 - 5.2 Assembled components are tested and adjusted/aligned in accordance with the applicable maintenance documentation using the appropriate test equipment
 - 5.3 Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Communication and navigation system components are from any or all of the following aircraft

- Very high frequency (VHF) communications
- High frequency (HF) communications
- Ultra-high frequency (UHF) communications
- Satellite communications

systems:

- Emergency location transmitter (ELT)
- Aeronautical Radio Incorporated (ARINC) Communication Addressing and Reporting System
- Intercommunication and public address
- Automatic direction finding (ADF) navigation
- Very high frequency omni-directional range (VOR) navigation
- Instrument landing system (ILS)
- Ground positioning system (GPS)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA285A Repair or overhaul aircraft radio frequency communication and navigation system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA285 Repair or overhaul aircraft radio frequency communication and navigation system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved repair/overhaul manuals, procedures and processes relating to analogue circuitry
- recognising the serviceability state and repair or overhaul requirements for aircraft RF communication and navigation system components
- applying logic processes, and using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly aligning components listed above to operate within prescribed specifications.

It is essential that component testing procedures, cleanliness requirements and safety precautions applicable to the system components being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing, alignment and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to testing, aligning and troubleshooting is essential. This may be demonstrated through application across a representative range of the components from systems listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component and system operation
- the basic function and operation of components of radio frequency communication and navigation systems to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post-repair or overhaul

- basic principles/functions relating to radio frequency communication and navigation system components and associated with:
 - advanced analogue fundamentals
 - digital fundamentals
 - AC and DC electrical systems
 - electromagnetic radiation
 - antenna and transmission line (including waveguide) characteristics
 - radio transmission/signal propagation and frequency modulation
 - GPS
- satellite communications (industry specific).

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special-purpose tools and test equipment would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated.
- Assessment should be made across a sufficient number of components to establish the ability to apply attained skills and knowledge across the full range of RF components with the aid of applicable maintenance manuals and data.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of components, applicable to the enterprise, from the following systems:
 - VHF communications
 - HF communications
 - UHF communications
 - satellite communications
 - ELT
 - ARINC Communication Addressing and Reporting System
 - intercommunication and public address
 - ADF navigation
 - VOR navigation
 - ILS

- GPS.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA286 Repair or overhaul aircraft electrical/electro-mechanical components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and knowledge of component repair and overhaul procedures relating to electrical and electro-mechanical components of fixed and rotary wing aircraft that are repaired or overhauled in aviation maintenance workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit of competency is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA201 Remove and install miscellaneous aircraft electrical hardware

MEA260 Use electrical test equipment

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Determine requirements
 - 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
 - 1.2 Components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required
 - 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components
 - 1.4 Extent of overhaul or repair is correctly identified and documented
2. Troubleshoot electrical/electro-mechanical components
 - 2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination
 - 2.2 Logical processes are used to ensure efficient and accurate troubleshooting
 - 2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement
 - 2.4 Electrical/electro-mechanical component faults are located and the causes of the faults are clearly identified
 - 2.5 Fault rectification requirements are determined to assist in planning the repair
3. Dismantle and inspect electrical/electro-mechanical components
 - 3.1 Component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements
 - 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
 - 3.3 Parts requiring specialist repair are tagged and repair instructions are accurately specified
 - 3.4 Parts lists are compiled and processed in accordance with standard enterprise procedure
4. Repair and/or modify electrical/electro-mechanical
 - 4.1 Component parts are repaired or replaced in accordance with the relevant maintenance documentation

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| components | 4.2 | Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures |
| 5. Assemble, test and adjust electrical/ electro-mechanical components | 5.1 | Assembly of component parts is carried out within specified tolerances and in accordance with the appropriate maintenance documents |
| | 5.2 | Components are adjusted or calibrated to operate within prescribed specifications |
| | 5.3 | Finished components are tagged, sealed and packaged in accordance with specified procedures |
| | 5.4 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- | | |
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| Electrical/electro-mechanical components include: | <ul style="list-style-type: none"> • Motors, generators and alternators • Static inverters, transformer rectifier units (TRU) and regulators • Actuators, solenoids and shutoff valves • Bus bars, circuit breakers, connectors, electrical looms and fans |
| Procedures and requirements include: | <ul style="list-style-type: none"> • Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise |

Unit Mapping Information

Release 1 – equivalent to MEA286A Repair or overhaul aircraft electrical/electro-mechanical components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA286 Repair or overhaul aircraft electrical/electro-mechanical components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved repair/overhaul procedures and processes relating to electrical and electro-mechanical components
- recognising the serviceability state and repair or overhaul requirements for:
 - alternating current (AC) and direct current (DC) motors, generators and alternators
 - static inverters
 - TRU
 - regulators/control units
 - actuators
 - solenoids and shutoff valves
 - engine ignition/starting components
- applying logic processes, and using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly disassembling, inspecting component parts, repairing/replacing/modifying component parts and assembling components listed above.

It is essential that component testing procedures, cleanliness requirements and safety precautions applicable to the system component being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a range of aircraft electrical/electro-mechanical components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component and system operation
- the basic function and operation of components listed below to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post repair or overhaul:
 - AC and DC motors, generators and alternators
 - static inverters
 - TRU
 - regulators/control units
 - actuators
 - solenoids and shutoff valves
 - engine ignition/starting components
- basic principles/functions, relating to components listed above and associated with:
 - AC and DC power generation
 - circuit theory
 - analogue fundamentals
- electro-mechanical interface.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that applicable general and special-purpose tools and test equipment would be used where appropriate.
- Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) component from each of the following groups:
 - motors, generators and alternators
 - static inverters, TRU and regulators
 - actuators, solenoids and shutoff valves
 - bus bars, circuit breakers, connectors, electrical looms and fans.

- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA287 Repair or overhaul aircraft oxygen system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, maintenance publications, test equipment and knowledge of oxygen component maintenance and hygiene requirements to repair and overhaul aircraft oxygen system components from fixed and rotary wing aircraft that are repaired or overhauled in aviation maintenance workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

This unit of competency is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. Determine requirements | 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 System components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is correctly identified and documented |
| 2. Troubleshoot oxygen system components | 2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | 2.2 Logical processes are used to ensure efficient and accurate troubleshooting |
| | 2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |
| | 2.4 System component faults are located and the causes of the faults are clearly identified |
| | 2.5 Fault rectification requirements are determined to assist in planning the repair |
| 3. Dismantle and inspect oxygen system components | 3.1 System component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements |
| | 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |
| | 3.3 Parts requiring specialist repair are tagged and repair instructions are accurately specified |
| | 3.4 Parts lists are compiled and processed in accordance with |

			standard enterprise procedures
4.	Repair and/or modify oxygen system components	4.1	System component parts are repaired or replaced in accordance with the relevant maintenance documentation
		4.2	Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures
5.	Assemble, test and adjust oxygen system components	5.1	Assembly of component parts is carried out within specified tolerances and in accordance with the appropriate maintenance documents
		5.2	System components are adjusted or calibrated to operate within prescribed specifications
		5.3	Finished components are tagged, sealed and packaged in accordance with specified procedures
		5.4	Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Oxygen system components and related activities include:

- Pressure vessels (testing and charging)
- Regulators, control valves and indicators
- Chemical oxygen generators
- Product hygiene

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA287A Repair or overhaul aircraft oxygen system components

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA287 Repair or overhaul aircraft oxygen system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved repair/overhaul procedures and processes relating to oxygen components
- recognising the serviceability state and repair or overhaul requirements for oxygen pressure cylinders, valves, gauges, chemical generators, regulators, masks, pipes, hoses and fittings, and liquid dry breathing oxygen (LDBO) converters
- applying logic processes, and using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability
- correctly disassembling, inspecting component parts, repairing/replacing/modifying component parts and assembling oxygen components
- applying product hygiene procedures.

The underlying skills inherent in this unit should be transferable across a range of repair or overhaul applications associated with oxygen system components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are fully observed, understood and complied with. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Evidence of transferability of skills and knowledge related to repair is essential. This may be demonstrated through application across a representative range of oxygen components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component and system operation
- the basic function and operation of oxygen components to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post-repair or overhaul
- basic principles/functions relating to oxygen components and associated with:

- pressure sensitive devices (bellows and controllers)
- vacuum system generation
- atmosphere and its properties.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance manuals. It is also expected that applicable general and special-purpose tools and test equipment would be used where appropriate.
- Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision across the following groups:
 - pressure vessels (testing and charging)
 - regulators, control valves and indicators
 - chemical oxygen generators
 - product hygiene.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA288 Repair or overhaul aircraft audio and visual systems and reproducers

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and knowledge of component repair and overhaul procedures relating to aircraft analogue and digital passenger entertainment electronic equipment components that are repaired or overhauled in aviation maintenance workshops during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Component Workshop Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA260 Use electrical test equipment

MEA261 Use electronic test equipment

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Determine requirements
 - 1.1 Audio and video system and reproducer component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers
 - 1.2 Circuitry is correctly prepared and connected to the applicable test equipment and is functionally tested or cycled through the prescribed test procedures in accordance with the maintenance documentation for evidence of serviceability or malfunction
 - 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components
 - 1.4 Extent of overhaul or repair is correctly identified and documented
2. Dismantle and inspect audio and video system and reproducer components
 - 2.1 Component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements
 - 2.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
 - 2.3 Parts requiring specialist repair are tagged and repair instructions are accurately specified
 - 2.4 Parts lists are compiled and processed in accordance with standard enterprise procedures
3. Repair and/or modify audio and video system and reproducer
 - 3.1 Component parts are repaired or replaced in accordance with the relevant maintenance documentation
 - 3.2 Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures
4. Assemble, test and adjust audio and video system and reproducer components
 - 4.1 Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents
 - 4.2 Assembled components are tested and adjusted in accordance with the applicable maintenance documentation using the appropriate test equipment
 - 4.3 Required maintenance documentation and modification records are completed and processed in accordance with

standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Audio and video systems and reproducers include:

- Video cassette recorders (VCRs)
- Video display systems
- Cathode ray tube (CRT) display systems
- Symbol generators
- Audio amplifiers
- Audio and video selectors
- Voice recorders
- Microphones
- Head sets
- Passenger control units (PCUs)
- Tape reproducers (and tape reproduction)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA288A Repair or overhaul aircraft audio and visual systems and reproducers

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA288 Repair or overhaul aircraft audio and visual systems and reproducers

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved repair/overhaul procedures and processes relating to analogue and digital circuitry
- recognising the serviceability state and repair or overhaul requirements for digital electronic interface systems:
 - VCRs
 - video display systems
 - CRT display systems
 - symbol generators
 - audio amplifiers
 - audio selectors
 - voice recorders
 - microphones
 - head sets
 - PCUs
 - tape reproducers (and tape reproduction)
- applying logic processes, and using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post-repair/overhaul serviceability.

It is essential that component testing procedures, cleanliness requirements and safety precautions applicable to the components being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to repair, modification and overhaul is essential. This may be demonstrated through application across a range of components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component and system operation
- the basic function and operation of audio and visual and reproducer components to enable testing for fault isolation/confirmation to determine repair or overhaul requirements, and serviceability status post-repair or overhaul
- basic principles/functions relating to audio and visual and reproducer components and associated with:
 - advanced analogue fundamentals
 - basic logic and semiconductor theory
 - digital fundamentals
 - electrostatic discharge (ESD) precautions
 - alternating current (AC) and direct current (DC) electrical systems
 - video display theory
 - video recorder theory
 - cleaning and maintenance techniques for video and recorder heads
 - aircraft display systems
 - symbol generation
 - vector and raster graphics
 - audio circuit theory
 - sound measurement
 - decibel (dB) level standards
 - audio tape control signals and recording techniques
 - basic logic and semiconductor theory
- cleaning and maintenance techniques for audio recorder heads.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that applicable general and special-purpose tools and test equipment would be used where appropriate.
- The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on an item from each of the following groups:
 - VCRs
 - video display systems
 - CRT display systems
 - symbol generators
 - audio amplifiers
 - audio and video selectors
 - voice recorders
 - microphones
 - head sets
 - PCUs
 - tape reproducers (and tape reproduction).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA289 Maintain basic light aircraft avionic systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the maintenance of basic aircraft avionic systems and components involving inspection, testing and troubleshooting and component removal and installation.

Applications include basic fixed wing and rotary wing aircraft where the avionic systems are limited to very high frequency (VHF) communications, basic audio system, automatic direction finding (ADF) and very high frequency omni-range (VOR) radio navigation systems, stand-alone global navigation systems (GNS), air traffic control (ATC) transponder and automatic dependent surveillance-broadcast (ADS-B) during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the small aircraft maintenance Certificate IV Mechatronics training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. Inspect basic aircraft avionic systems and components | 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 Avionic systems are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | 1.4 Defects are correctly identified and reported |
| 2. Test/adjust basic aircraft avionic systems | 2.1 Aircraft and systems are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 Avionic systems are functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. Troubleshoot basic aircraft avionic systems | 3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting using test sets, maintenance data and fault-finding charts or similar, to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required and in accordance with standard enterprise procedures |

- 3.5 Rectification requirements are determined
4. Remove and install basic aircraft avionic system components
- 4.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety
- 4.2 Avionic component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements
- 4.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
- 4.4 Removed components are tagged and packaged in accordance with specified procedures
- 4.5 Avionic components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
- 4.6 Physical installation of avionic components is performed in accordance with the applicable maintenance manual
- 4.7 System is reinstated to correct operational condition in preparation for testing and calibration or adjustment, as necessary
- 4.8 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Avionic systems include:**
- VHF communication
 - Basic audio systems, such as intercom and audio

- selection
- ADF
 - VOR
 - Stand-alone GNS
 - ATC transponder
 - ADS-B
 - ELT
- Avionic components include:**
- Transmitters and receivers
 - Antennas and antenna cables
 - Control boxes and frequency selectors
 - Speakers
 - Switches
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA289A Maintain basic light aircraft avionic systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA289 Maintain basic light aircraft avionic systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the avionic system being maintained
- locating and identifying avionic system components comprising:
 - VHF communications systems
 - VOR and ADF navigation systems
 - basic audio systems
 - stand-alone GNS systems
 - ATC transponders
 - ADS-B
 - ELT systems
- locating and identifying applicable antennas
- recognising system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in the systems listed above
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the above systems
- testing listed systems to isolate system faults and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the avionic system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting and component removal and installation is essential. This is to be demonstrated through application across a range of avionic systems and components as specified in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware, and plugs
- handling precautions for electrostatic sensitive devices
- the basic layout (block diagram level), function and operation of:
 - VHF communications systems
 - VOR and ADF navigation systems
 - basic audio systems
 - stand-alone GPS systems
 - ATC transponders
 - ADS-B
 - ELT systems
- basic principles/functions, relating to the above systems and associated with:
 - electromagnetic radiation and propagation
 - basic AC and DC circuit theory
 - printed circuit boards
 - digital fundamentals
 - analogue fundamentals
 - transmitter and receiver principles
 - pulse
 - antenna characteristics
 - transmission line characteristics
 - fibre optic communications
- maintenance requirements and troubleshooting procedures
- applicable maintenance data and manuals
- relevant WHS practices
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.

- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on each of the following systems and on at least one (1) major component/line replaceable unit (LRU) in each case:
 - VHF communication
 - basic audio systems, such as intercom and audio selection
 - ADF
 - VOR
 - stand-alone GPS
 - ATC transponder
 - ADS-B
 - ELT.
- Component removal and installation competencies are to be demonstrated on at least one (1) component from each of:
 - transmitters and receivers
 - antennas and antenna cables
 - control boxes and frequency selectors
 - speakers
 - switches.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
-

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA290 Fit avionic modification sheet metal components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications and modification documentation to perform sheet metal work associated with avionic modifications being incorporated on small fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Prepare to fit avionic modification sheet metal components | 1.1 Applicable sheet metal components are identified in accordance with applicable modification instructions and maintenance documentation |
| | 1.2 All required materials and equipment are selected and organised in accordance with the applicable modification instructions and maintenance documentation |
| 2. Fit avionic modification sheet metal components | 2.1 Sheet metal components are fitted in accordance with the modification instructions, ensuring that aircraft standard practices are used and standard process requirements are carried out while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE) |
| | 2.2 Work area is cleaned of all waste material |
| 3. Complete modification activities | 3.1 Required documentation is accurately completed and correctly processed in accordance with enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Sheet metal components include:

- Doublers for the installation of antennas
- Brackets for the installation of avionic system components

- Procedures and requirements include:**
- Racks for components, such as transmitters/receivers
 - Hardware for the support of antenna cables and system electrical wiring
 - Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA290A Fit avionic modification sheet metal components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA290 Fit avionic modification sheet metal components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using enterprise procedures, approved maintenance documentation and aircraft publications relating to aircraft sheet metal components
- identifying various aircraft metals used for sheet metal components and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metals used for sheet metal components, including sealing agents, to industry standards
- identifying aircraft sheet metal assembly fasteners (metal and non-metallic) by interpretation of markings, numbering systems, size, shape and colour
- correctly interpreting, modification drawings and hand sketches
- using appropriate hand tools and machines to fit avionic modification sheet metal components to the aircraft
- freehand precision hole generation
- applying corrosion prevention techniques during component fitment
- restoring sealing and surface finishes.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices, and processes associated with assembly.

Evidence of knowledge about enterprise procedures relating to avionic modification incorporation and practices relating to associated sheet metal component installation will be necessary to supplement evidence of ability to fit a range of sheet metal components in a specific application.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft sheet metal component construction principles

- identification of primary, secondary and tertiary structure
- aircraft sheet metal assembly fasteners, their characteristics and identification
- fits and clearances for fasteners
- fitting methods for fasteners
- use of grip pins
- corrosion of aircraft structure and its prevention
- application of surface finishes
- relevant WHS procedures
- how to obtain MSDS
- use of PPE.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved on the following range of sheet metal components:
 - doublers for the installation of antennas
 - brackets for the installation of avionic system components
 - racks for components, such as transmitters/receivers
 - hardware for the support of antenna cables and system electrical wiring.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA291 Inspect, test and troubleshoot fixed wing single axis autopilot systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot fixed wing aircraft single axis autopilot systems (including those with radio navigation system interfaces) and components during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA207 Remove and install aircraft electronic system components

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Inspect fixed wing single axis autopilot systems and components
 - 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements
 - 1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements
 - 1.3 Single axis autopilot system and components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual
 - 1.4 Defects are correctly identified and reported
2. Test/adjust fixed wing single axis autopilot systems and components
 - 2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
 - 2.2 Autopilot systems are functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
 - 2.3 System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot fixed wing single axis autopilot systems
 - 3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination
 - 3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting
 - 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process, using fault-finding charts or similar, to line replacement level
 - 3.4 Autopilot system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
 - 3.5 Rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA291A Inspect, test and troubleshoot fixed wing single axis autopilot systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA291 Inspect, test and troubleshoot fixed wing single axis autopilot systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the single axis autopilot system being maintained
- recognising system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses) and security in:
 - autopilot system components
 - radio navigation system interfaces
- applying logic processes, taking and interpreting system measurements, and using test equipment and appropriate wiring diagrams and manuals, to accurately and effectively isolate system malfunctions
- testing the system to isolate system malfunctions and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the autopilot system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting is essential. This is to be demonstrated through application across an autopilot system and its components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- the basic layout (block diagram level), function and operation of:

- autopilot system components
- interface with radio navigation systems
- autopilot system maintenance requirements and troubleshooting procedures
- relevant WHS practices
- basic principles/functions, relating to the listed systems and associated with:
 - basic AC and DC circuit theory
 - digital fundamentals
 - analogue fundamentals
 - fixed wing flight theory
 - inner and outer loop control
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special-purpose tools, test and ground support equipment, would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- Applicable skills and knowledge gained through the attainment of similar or related competencies must be taken into consideration during assessment.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on an autopilot system and its components. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA301 Perform aircraft flight servicing

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and standard trade practices in the performance of pre and post-flight servicing activities and the application of aircraft ground handling procedures on both fixed and rotary wing aircraft.

The unit is part of Avionic and Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---------------------------------|---|
| 1. Prepare for flight | 1.1 Aircraft is positioned as required |
| | 1.2 Ground locks, aircraft support and safety devices and covers are removed and stowed in accordance with maintenance documentation |
| | 1.3 Aircraft tie-down devices are removed and stowed/stored |
| 2. Inspect aircraft and systems | 2.1 Preparation of the aircraft and systems is appropriate to allow for proper inspection |
| | 2.2 Aircraft and systems are visually or physically checked for external signs of defects in accordance with maintenance documentation while observing all relevant work health and safety (WHS) requirements |
| 3. Replenish aircraft systems | 3.1 Fluid level checks and replenishments are carried out in accordance with maintenance documentation requirements while observing all relevant WHS requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 3.2 Maintenance of gaseous levels (nitrogen and compressed air) is carried out in accordance with maintenance documentation requirements while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 3.3 Role equipment/components requiring pre-flight replacement are changed as required by maintenance documentation |
| | 3.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Flight servicing activities are performed during:

- Preparation for flight following maintenance
- Before flight servicing
- After flight servicing
- Turn around servicing

Maintenance documentation includes:

- Maintenance manuals
- Servicing schedules
- Applicable airworthiness regulations
- Aircraft maintenance program

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA301C Perform aircraft flight servicing

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA301 Perform aircraft flight servicing

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- ground handling of aircraft
- using hand skills and tools to perform flight servicing activities
- correctly installing and securing of aircraft hardware
- locating, using and correctly stowing of aircraft safety and security equipment (includes ground locks, covers, support and safety devices and tie-down devices)
- applying ground power (where applicable)
- inspecting structure for damage and deterioration
- recognising external signs of component damage, leakage and security in aircraft systems
- recognising visual signs of damage, leakage and security with regard to engines and propellers (where applicable)
- refuelling the aircraft with the correct type, quantity and distribution of fuel
- checking and replenishing fluid level using the correct fluids
- recharging of gaseous levels using the correct support equipment and procedures
- checking fire protection systems (where applicable) for correct gas charge levels and portable fire extinguishers for serviceability and correct stowage
- replacing role equipment requiring pre-flight replacement
- using of maintenance data and manuals to determine flight servicing requirements and procedures
- applying standard procedures
- observing all relevant WHS procedures, including the use of MSDS and items of PPE.

It is essential that the specific aspects of the aircraft flight servicing are checked to ensure quality and safety standards are fully observed, understood and complied with. Safety precautions applicable to the system being maintained are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action.

Evidence of knowledge of system operation, recognition of defects and completion of documentation, the relationship of individual components and the links with other systems will be necessary to the extent required for completion of flight servicing before undertaking any action.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- the aircraft structure to the extent required to be able to recognise typical types of structural damage and deterioration during flight servicing activities
- system layout, operation and typical external signs of faults to the extent required to perform flight servicing activities
- aircraft flight servicing requirements
- ground de-icing of aircraft
- aircraft ground handling procedures, including towing and marshalling
- aircraft safety and security equipment, including:
 - ground locks
 - wheel chocks
 - covers
 - support and safety devices
 - tie-down devices and picketing
- types and characteristics of fuels and fuel additives
- types and characteristics of lubricants
- types and characteristics of hydraulic fluids
- WHS procedures relating to flight servicing activities
- how to obtain MSDS
- selection and use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on the following flight servicing that are applicable to the enterprise:
 - preparation for flight following maintenance
 - before flight servicing

- after flight servicing
- turn around servicing.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA302 Remove and install aircraft hydro-mechanical and landing gear system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway and may also be part of a Structures Certificate IV training pathway. It requires application of hand skills and standard trade practices in the removal and installation of aircraft hydro-mechanical system and landing gear components fitted to both fixed and rotary wing aircraft during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Remove hydro-mechanical system components | 1.1 Hydro-mechanical system is rendered safe and prepared in accordance with the applicable maintenance manual, including fitment of isolation tags, where necessary, to ensure personal safety |
| | 1.2 Removal of hydro-mechanical components is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.3 Required maintenance documentation is accurately completed and correctly processed |
| | 1.4 Removed components are tagged, sealed and packaged in accordance with specified procedures |
| 2. Remove landing gear components | 2.1 The aircraft is jacked as specified in the maintenance manual for landing gear component removal |
| | 2.2 Removal of components is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 2.3 Required maintenance documentation is accurately completed and correctly processed |
| | 2.4 Removed components are tagged, sealed and packaged in accordance with specified procedures |
| 3. Install hydro-mechanical system components | 3.1 Components to be installed are checked to confirm correct part numbers, serviceability and modification status |
| | 3.2 Component installation is carried out in accordance with |

- the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- 3.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
4. Install landing gear components
- 4.1 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
- 4.2 Component installation is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- 4.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Hydro-mechanical systems include:

- Hydraulic systems
- Fuel systems

Components of hydro-mechanical systems include:

- Hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges
- Fuel system filters, valves, pumps, rigid and flexible storage cells/tanks
- Rigid and flexible pipelines, hoses and fittings

Landing gear components include:

- Wheel assemblies or skids
- Brake units (not applicable to rotary wing aircraft with skids or floats)
- Struts/oleos (not applicable to rotary wing aircraft with

skids or floats)

Electrical interface includes: • Associated electrical loom terminations and/or plugs where components are electrically actuated or controlled

Procedures and requirements include: • Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA302C Remove and install aircraft hydro-mechanical and landing gear system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA302 Remove and install aircraft hydro-mechanical and landing gear system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills and tools to remove and install hydraulic and fuel system components
- jacking of the aircraft as required for landing gear component removal and installation
- correctly installing and securing of aircraft hardware
- using hand skills and tools to remove and install landing gear components and the correct handling of heavy components
- using maintenance manuals to prepare the aircraft for component removal and installation and correct interpretation of removal and installation instructions
- applying standard procedures
- observing all relevant WHS procedures including the use of MSDS and relevant items of PPE.

It is essential that system cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types, but must cover a sufficient range of tasks to demonstrate familiarity with attachment methods, connection hardware and couplings peculiar to each type of system, and of safe handling of heavy components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- hydraulic fluids (mineral and synthetic) and handling precautions
- hydraulic seal types and applications
- how to locate and correctly remove and install components of hydraulic systems
- aircraft fuels and handling precautions
- fuel seal types and applications

- how to locate and correctly remove and install fuel system components
- electrical circuit isolation and plug removal and installation
- how to jack the aircraft for landing gear component removal and installation
- how to locate and correctly remove and install landing gear components, including the handling of heavy components
- WHS procedures relating to hydraulic systems, fuel systems and landing gear components
- how to obtain MSDS
- the selection and use of items of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on each type of system and on at least one (1) component of each group listed in the Range of Conditions, as follows:
 - hydraulic systems – preparation of a system for safe component removal and replacement of at least one (1) component from each of the following groups of components:
 - hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges
 - rigid and flexible pipelines, hoses and fittings
 - fuel systems – preparation of a system for safe component removal and replacement of at least one (1) component from each of the following groups of components:
 - fuel system filters, valves, pumps, rigid and flexible storage cells/tanks
 - rigid and flexible pipelines, hoses and fittings
 - landing gear components – one (1) each of:
 - wheel assemblies or skids
 - brake units
 - struts/oleos.
- Coverage of brakes and struts/oleos are not required where the aircraft is rotary wing and is fitted with skids or floats.

- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA303 Remove and install aircraft pneumatic system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications to remove and install aircraft pneumatic system components from pressurisation systems, air cycle air conditioning systems and fire-extinguishing systems of fixed and rotary wing aircraft during scheduled and unscheduled maintenance.

The unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways and may also be part of a Structures Certificate IV training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Remove pneumatic system components | 1.1 Pneumatic system is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety |
| | 1.2 Removal of components is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| | 1.4 Removed components are tagged, sealed and packaged in accordance with specified procedures |
| 2. Install pneumatic system components | 2.1 Components to be installed are checked to confirm correct part numbers, serviceability and modification status |
| | 2.2 Installation is carried out to pneumatic system in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 2.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Pneumatic components include:

- Filters, valves, pumps, motors, actuators and regulators
- Gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers
- Heat exchangers, pressure vessels, condensers, compressors, expansion turbines and humidifiers
- Rigid and flexible pipelines, hoses and fittings
- Ducting
- Fire-extinguishers, including those containing ozone depleting substances (ODS) or synthetic greenhouse gas (SGG) extinguishing agents (e.g. BCF) (where applicable to the enterprise)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA303D Remove and install aircraft pneumatic system components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA303 Remove and install aircraft pneumatic system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
 - locate and correctly remove and install components in pneumatic systems, including fire-extinguishing systems
 - locate and correctly remove and install components in air cycle air conditioning systems
 - locate and correctly remove and install components in pressurisation systems
 - correctly remove and install rigid and flexible pipelines
 - correctly remove and install ducting
- observing regulations governing the handling and custody of fire-extinguishers containing ODS or SGG extinguishing agents (e.g. BCF).

It is essential that system cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types, but must cover a sufficient range of tasks to demonstrate familiarity with attachment methods, connection hardware and couplings peculiar to each type of system, and of safe handling of heavy components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection hardware and couplings
- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- how to locate and correctly remove and install components of:
 - pneumatic systems

- air cycle air conditioning system components
- pressurisation system components
- fire-extinguishers, including the effect of ODS or SGG extinguishing agents and regulations covering special precautions and handling requirements for BCF fire-extinguishers
- electrical circuit isolation and plug removal and installation
- WHS procedures relating to pneumatic, air conditioning and pressurisation systems
- how to obtain MSDS
- the selection and use of items of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including those relating to the handling and control of halon fire-extinguishers.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on one (1) item from each from the following groups:
 - filters, valves, pumps, motors, actuators and regulators
 - gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers
 - heat exchangers, pressure vessels, condensers, compressors, expansion turbines and humidifiers
 - rigid and flexible pipelines, hoses and fittings
 - ducting
 - fire-extinguishers, including those containing ODS or SGG extinguishing agents (e.g. BCF) (may be omitted where not applicable to enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

- Individuals being assessed who have already attained MEA355 Maintain light aircraft air cycle air conditioning systems, and/or MEA356 Maintain light piston engine aircraft pressurisation systems, will have satisfied the requirements of this unit with regard to common Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to MEA355 Maintain light aircraft air cycle air conditioning systems and MEA356 Maintain light piston engine aircraft pressurisation systems, may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA304 Remove and install non-pressurised aircraft structural and non-structural components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and maintenance publications to remove and install structural and non-structural components from non-pressurised fixed and rotary wing aircraft during scheduled and unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It may also be part of a Structures Maintenance Certificate IV training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA302 Remove and install aircraft hydro-mechanical and landing gear system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

- essential outcomes. demonstrate achievement of the element.
1. Remove components
 - 1.1 Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage to aircraft or component during component removal
 - 1.2 Component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
 - 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 1.4 Where applicable, removed components are tagged and prepared for transport in accordance with specified procedures
 2. Install components
 - 2.1 Structural and/or non-structural components to be installed are checked to confirm correct part numbers, serviceability and modification status
 - 2.2 Component installation is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 2.3 Support/safety equipment is removed at an appropriate time to ensure personnel safety and freedom from structural damage
 - 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Removable components of structure include:

- Those that are installed using bolts and/or screws. Where component removal and installation requires the removal and installation of rivets the applicable unit is either MEA339 Inspect, repair and maintain aircraft structures, MEA369 Inspect and maintain structures and related components of non-pressurised small aircraft or MEA371 Perform major repairs and modifications to small aircraft metal structure.
- Removable components include:
 - removable components of wings, tail booms, pylons, empennage, skids, fairings and nacelles
 - removable components or sections of non-pressurised fuselages
 - non-pressurised fuselage entry, cargo, access doors and associated seals, including checking and adjustment of all doors and access panels and associated locking mechanisms
 - non-pressurised fuselage windows and transparent panels
 - where applicable, trim panels, linings, seats, cabin equipment and consoles, floor panels and coverings
 - applicable emergency equipment, including passenger escape systems, life jackets, rafts, location transmitters, beacons, crew and passenger seat restraints

Sealant removal and application includes:

- The removal and application of faying (contact or overlapping) surface and fuel tank sealants is included, where applicable

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA304C Remove and install non-pressurised aircraft structural and non-structural

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA304 Remove and install non-pressurised aircraft structural and non-structural components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- applying relevant WHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
 - remove and install structural and non-structural components
 - remove and install aircraft interior fittings
 - remove and install doors, door seals, windows and transparent panels
 - checking and adjusting all doors and access panels, including locking mechanisms
- removing and installing emergency equipment.

It is essential that shoring, trestling and lifting requirements and safety precautions applicable to the structure being maintained are fully observed, understood and complied with.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through application across the component groups listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- structural and non-structural component methods of construction and attachment, faying surface treatment and fuel tank sealing
- non-pressurised fuselage aircraft doors, related seals and window and transparent panel construction, attachment methods and sealing
- aircraft interior fittings (trim, linings, seats, floor panels, and so on) construction and attachment methods
- the location and attachment or stowage methods for emergency equipment
- relevant WHS practices
- how to obtain MSDS
- use of PPE

- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of component handling, attachment methods, adjustment and sealing as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following component groups:
 - removable components of wings, tail booms, pylons, empennage, skids, fairings and nacelles
 - removable components or sections of non-pressurised fuselages
 - non-pressurised fuselage entry, cargo, access doors and associated seals, including checking and adjustment of all doors and access panels and associated locking mechanisms
 - non-pressurised fuselage windows and transparent panels
 - where applicable, trim panels, linings, seats, cabin equipment and consoles, floor panels and coverings
 - applicable emergency equipment, including passenger escape systems, life jackets, rafts, location transmitters, beacons, crew and passenger seat restraints.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA305 Remove and install aircraft fixed wing flight control system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications to remove and install aircraft flight control system components of fixed wing aircraft during scheduled and unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway. It may also be part of a Structures Maintenance Certificate IV training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA302 Remove and install aircraft hydro-mechanical and landing gear system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

- | | |
|---|---|
| <p>1. Remove fixed wing flight control system components</p> | <p>1.1 System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety</p> <p>1.2 Fixed wing flight control system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements</p> <p>1.3 Required maintenance documentation is accurately completed and correctly processed</p> <p>1.4 Removed components are tagged, sealed and packaged in accordance with specified procedures</p> |
| <p>2. Install fixed wing flight control system components</p> | <p>2.1 Components to be installed are checked to confirm correct part numbers, serviceability and modification status</p> <p>2.2 Mass balance of control surfaces to be installed is checked in accordance with the applicable maintenance manual, if required</p> <p>2.3 Installation is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements</p> <p>2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures</p> |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Flight control system

- Ailerons, elevators, rudders, trim tabs, speed brakes,

components include:

spoilers, flaps and slats

- Actuators – mechanical, hydraulic, pneumatic or electric
- Mechanical flight control components (cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks, wheels or columns, trim wheels or handles, rudder pedals)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA305C Remove and install fixed wing flight control system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA305 Remove and install aircraft fixed wing flight control system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using relevant maintenance documentation and aircraft manuals to:
 - remove flight control surfaces
 - check the mass balance of control surfaces, where required
 - install flight control surfaces
 - remove power flight control system components
 - install power flight control system components
 - remove mechanical flight control system components
 - install mechanical flight control system components.

It is essential that safety precautions applicable to the fixed wing flight control system being maintained are fully observed, understood and complied with (especially flight control system inter-relationships with other systems where applicable). An awareness of dual inspection requirements associated with work on flight controls and systems must also be demonstrated.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through removal and installation of a representative range of the fixed wing flight control system components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- flight control surface and system component attachment methods
- connection hardware and couplings
- electrical circuit isolation and plug removal and installation
- requirements for balancing of control surfaces
- flight control system rigging requirements
- requirements for independent inspection of work performed on flight control systems and components

- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of component attachment methods and the need for adjustment or rigging and system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following component groups:
 - ailerons, elevators, rudders, trim tabs, speed brakes, spoilers, flaps and slats
 - actuators – mechanical, hydraulic, pneumatic or electric
 - mechanical flight control components (cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks, wheels or columns, trim wheels or handles, rudder pedals).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA351 Maintain airframe systems of basic light fixed wing aircraft have satisfied the requirements of this unit with regard to common Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to MEA351 Maintain airframe systems of basic light fixed wing aircraft may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A306 Remove and install engines and engine system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications to remove and install gas turbine or piston engines and engine system components of fixed and rotary wing aircraft during scheduled and unscheduled maintenance.

Work may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|------------------------------------|--|
| 1. Remove engine | 1.1 Aircraft is prepared and supported and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during engine removal |
| | 1.2 Removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.3 Engine is tagged and prepared for transport or storage in accordance with the specified procedures |
| | 1.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. Remove engine system components | 2.1 Aircraft and/or engine system is prepared and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel |
| | 2.2 Removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 2.3 Engine system component is tagged and prepared for transport or storage in accordance with the specified procedures |
| | 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 3. Install engine | 3.1 Engine to be installed is checked to confirm correct part or |

- model numbers, modification status and serviceability
- 3.2 Installation is carried out in accordance with the applicable maintenance manual
 - 3.3 Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
 - 3.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
4. Install engine system components
 - 4.1 Engine components to be installed are checked to confirm correct part or model numbers, modification status and serviceability
 - 4.2 Installation is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 4.3 Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
 - 4.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Engines and engine system components include:

- Engine change unit or auxiliary power unit (turbo-prop, turbofan, turboshaft, turbojet and piston)
- Fuel, oil and air system (or induction and super/turbo charger systems in the case of piston engine) components

- Engine control system components
- Ignition or igniter system components
- Starting system components
- Fire protection system components.
- Accessories and associated drives
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA306C Remove and install engines and engine system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA306 Remove and install engines and engine system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS practices, including lifting and handling heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
 - correctly remove and install engines, engine change units and auxiliary power units (APUs)
 - prepare removed engines for transportation and/or storage
 - locate and correctly remove and install the range of engine system components listed in the Range of Conditions
- identifying the requirement for adjustment and rigging of systems and controls after the installation of engines or system components.

It is essential that safety precautions applicable to engines and engine systems being maintained are fully observed, understood and complied with, including allowance for the effect on aircraft centre of gravity when engines are removed. Awareness must be demonstrated of dual inspection requirements associated with work on engine control systems.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through removal and installation of a representative range of engines and engine system components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- removal and installation procedures for aircraft:
 - engines
 - engine change units
 - APUs
- engine inhibiting and de-inhibiting procedures
- layout, installation and connection of components of:

- fuel systems
- lubrication systems
- air systems
- super and turbo charging systems
- exhaust systems
- ignition and igniter systems
- starting systems
- fire protection systems
- accessories and associated drives
- engine control system component removal and installation, including the requirement for rigging and for the independent inspection of work performed
- engine maintenance documentation and manuals
- relevant WHS practices, including those relating to the lifting and handling of heavy items
- how to obtain MSDS
- use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment, or by the use of simulated activities, using tools and equipment specified in aircraft maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of component attachment methods and the need for adjustment, rigging and system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - engine change unit or auxiliary power unit (turbo-prop, turbofan, turboshaft, turbojet, piston)
 - fuel, oil and air system (or induction and super/turbo charger systems in the case of piston engine) components
 - engine control system components
 - ignition or igniter system components
 - starting system components
 - fire protection system components.
 - accessories and associated drives.

- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA353 Maintain basic light aircraft engines and propellers will have satisfied the requirements of this unit with regard to common Range Statement variables. The Log of Industrial Experience and Achievement records relating to MEA353 Maintain basic light aircraft engines and propellers may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A307 Remove and install propeller systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications to remove and install fixed wing aircraft propellers and propeller system components during scheduled and unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--------------------------------------|---|
| 1. Remove propellers and components | <p>1.1 System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices</p> <p>1.2 Isolation and warning signs are installed/fitted to ensure personnel safety and freedom from damage during component removal</p> <p>1.3 Propeller system component removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)</p> <p>1.4 Required aircraft maintenance documentation is accurately completed and correctly processed</p> <p>1.5 Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices</p> |
| 2. Install propellers and components | <p>2.1 Propeller system components to be installed are checked to confirm correct part numbers, serviceability and modification status</p> <p>2.2 Component installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices while observing all relevant WHS requirements, including the use of MSDS and items of PPE</p> <p>2.3 Support/safety equipment is removed at an appropriate time to ensure personnel safety and freedom from structural damage</p> |

- 2.4 Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Propeller system components include:

- Propellers, including spinners, where fitted
- Constant speed, feathering and reversing propeller drives
- Beta control systems and governors
- Controls and linkages
- De-ice/anti-ice equipment (where applicable to the enterprise)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA307C Remove and install propeller systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA307 Remove and install propeller systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including lifting and handling heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
 - correctly remove and install propellers and related components, such as spinners
 - locate and correctly remove and install pitch control system components
 - locate and correctly remove and install propeller de-icing system components (where applicable to the enterprise)
- identifying requirements for adjustment and rigging of systems and controls.

It is essential that shoring, trestling and lifting requirements and safety precautions applicable to propeller system maintenance are fully observed, understood and complied with, and that an awareness is demonstrated of dual inspection requirements.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through application across a representative range of propeller system components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- propeller attachment methods and removal and installation procedures
- propeller system component attachment methods for:
 - spinners
 - governors
 - beta control systems
 - de-ice and anti-ice systems
- controls and control linkages including the requirement for rigging and for independent inspection of work performed
- electrical circuit isolation, plug removal and installation

- relevant WHS practices, including those relating to lifting and handling of heavy items
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in aircraft maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of component attachment methods, the need for adjustment or rigging and system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - propellers, including spinners, where fitted
 - constant speed, feathering and reversing propeller drives
 - beta control systems and governors
 - controls and linkages
 - de-ice/anti-ice equipment (may be omitted where it is not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA308 Remove and install rotary wing rotor and flight control system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications to remove and install rotary wing aircraft rotors and associated flight control system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA302 Remove and install aircraft hydro-mechanical and landing gear system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

- essential outcomes. demonstrate achievement of the element.
1. Remove rotary wing rotor
 - 1.1 System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
 - 1.2 Isolation and warning signs are installed/fitted to ensure personnel safety
 - 1.3 Rotary wing rotor removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices while observing all relevant work health and safety (WHS) requirements
 - 1.4 Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 1.5 Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
 2. Remove rotary wing flight control system components
 - 2.1 System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
 - 2.2 Isolation and warning signs are installed/fitted to ensure personnel safety
 - 2.3 Rotary wing flight control system component removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices while observing all relevant WHS requirements
 - 2.4 Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 2.5 Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practice
 3. Install rotary wing rotor
 - 3.1 Rotor to be installed is checked to confirm correct part or model numbers, modification status and serviceability

- 3.2 Mass balance of rotor blades/head is checked in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
 - 3.3 Installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices while observing all relevant WHS requirements
 - 3.4 Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
4. Install rotary wing flight control system components
 - 4.1 Rotary wing flight control system components to be installed are checked to confirm correct part or model numbers, modification status and serviceability
 - 4.2 Installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices while observing all relevant WHS requirements
 - 4.3 Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
 - 4.4 Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Rotary wing rotors and flight control system

- Main rotor blades and tail rotor blades
- Rotor heads

components include:

- Swash plates, and tail rotor pitch control assemblies
- Mechanical flight control components (i.e. cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, control sticks or columns, tail rotor pedals) and mechanical components of powered flight control systems
- Main rotor, intermediate or tail rotor gearboxes
- Drive shafts and couplings

Powered flight controls

- In the case of hydraulically powered rotor control system components and related plumbing, maintenance work should be assessed against MEA302 Remove and install aircraft hydro-mechanical and landing gear system components

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA308C Remove and install rotary wing rotor and flight control system and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA308 Remove and install rotary wing rotor and flight control system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including lifting and handling heavy components
- using relevant maintenance documentation and aircraft manuals to:
 - correctly remove and install main rotors and rotor heads
 - check the mass balance of rotor blades and heads
 - correctly remove and install tail rotor blades and pitch control assemblies
 - locate and correctly remove and install mechanical flight control system components
 - locate and correctly remove and install drive train components, such as gearboxes and drive shafts and couplings
 - identify the requirements for component balancing
- identifying the requirements for adjustment and rigging of systems after component removal and installation.

It is essential that safety precautions applicable to the rotary wing rotor and flight control system components being maintained, including allowance for the effect on weight and balance (i.e. centre of gravity) when heavy components are removed, are fully observed, understood and complied with.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This may be demonstrated through removal and installation of a representative range of the rotary wing rotor and flight control system components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- removal and installation procedures for:
 - main rotors and rotor blades
 - rotor heads

- tail rotors and tail rotor blades
- swash plates
- tail rotor pitch control assemblies
- requirements for the checking and adjustment of blade tracking after rotor maintenance
- control system layout, linkages and operation (operation only to the extent necessary for the specified tasks), including the requirement for rigging and the independent inspection of work performed
- power train layout and assembly:
 - main rotor gearboxes
 - intermediate gearboxes
 - tail rotor gearboxes
 - drive shafts
 - couplings
- relevant WHS practices, including those relating to lifting and handling of heavy items
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in aircraft maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate
- An understanding of component attachment methods, the need for adjustment or rigging and system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - main rotor blades and tail rotor blades
 - rotor heads
 - swash plates, tail rotor pitch control assemblies
 - mechanical flight control components (i.e. cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, control sticks or columns, tail rotor pedals) and mechanical components of powered flight control systems
 - main rotor, intermediate or tail rotor gearboxes
 - drive shafts and couplings.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA352 Maintain basic rotary wing aircraft systems will have satisfied the requirements of this unit with regard to common Range Statement variables. The Log of Industrial Experience and Achievement records relating to MEA352 Maintain basic rotary wing aircraft systems may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA309 Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, standard trade practices and systems knowledge in the inspection, testing and troubleshooting of aircraft hydro-mechanical and landing gear systems and components of fixed and rotary wing aircraft during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA302 Remove and install aircraft hydro-mechanical system and landing gear components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.		demonstrate achievement of the element.
1. Inspect hydro-mechanical systems and components	1.1	Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with specified procedures
	1.2	Hydro-mechanical system and system components are visually or physically checked for external signs of defects in accordance with specified procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
2. Inspect landing gear systems and components	2.1	Isolation tags already attached to the system or related systems are checked and aircraft configured, including jacking where necessary, for safe system inspection and operation in accordance with specified procedures
	2.2	Landing gear system and system components are visually or physically checked for external signs of defects in accordance with specified procedures while observing all relevant WHS requirements, including the use of MSDS and PPE
3. Test hydro-mechanical and landing gear systems	3.1	The aircraft and hydro-mechanical systems are correctly prepared, in accordance with specified procedures, for the application of power
	3.2	Power is applied and system functionally tested, in accordance with specified procedures, for evidence of malfunction or leaks
	3.3	System calibration or adjustments are performed in accordance with specified procedures
4. Prepare for troubleshooting	4.1	Relevant maintenance documentation and modification status, including system defect/ service difficulty reports where relevant, are interpreted to identify an unserviceability
5. Troubleshoot hydro-mechanical and landing gear systems	5.1	Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	5.2	Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level

- 5.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
- 5.4 Hydro-mechanical and landing gear system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
- 5.5 Fault rectification requirements are determined to assist in planning the repair or adjustment

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- | | |
|--|---|
| Hydro-mechanical systems include: | <ul style="list-style-type: none">• Hydraulic systems• Fuel systems |
| Components of hydro-mechanical systems include: | <ul style="list-style-type: none">• Hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges• Fuel system filters, valves, pumps, rigid and flexible storage cells/tanks• Rigid and flexible pipelines, hoses and fittings |
| Landing gear systems include: | <ul style="list-style-type: none">• Retraction systems• Steering systems• Brake systems, including anti-skid, where applicable |
| Landing gear components include: | <ul style="list-style-type: none">• Wheel assemblies, skids and floats• Brake units• Struts/oleos |
| (Components of landing gear systems are included in hydro-mechanical system components) | |
| Procedures and | <ul style="list-style-type: none">• Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise |

requirements include:

Electrical interface includes: • Associated electrical loom terminations and/or plugs

Unit Mapping Information

Release 1 – equivalent to MEA309C Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA309 Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills and tools in the inspection, adjustment and troubleshooting of hydraulic, fuel and landing gear systems
- using hand skills and tools in the inspection, adjustment and troubleshooting of hydraulic and fuel system components
- jacking of the aircraft, as required, for landing gear system inspection, testing and troubleshooting
- using hand skills and tools in the inspection, adjustment and troubleshooting of landing gear components
- using maintenance manuals to prepare the aircraft for inspection, testing and troubleshooting of hydro-mechanical and landing gear systems and components
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- recognising external defects in hydro-mechanical and landing gear systems and components
- applying standard procedures
- observing all relevant WHS practices, including the use of MSDS and PPE.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft hydro-mechanical and landing gear systems and their components.

It is essential that system test procedures take into account all safety precautions applicable to the system being maintained, especially where system operation/switching interrelates to other systems being maintained.

Ability to interpret system performance specifications (allowable limits) and apply them in practice is critical and shall be demonstrated through application across the range of systems listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- fluid power theory
- hydraulic system layout, operation and characteristics (including electrical system interfaces) and system component construction and operation for:
 - flight control systems including primary controls, flaps, speed brakes and spoilers
 - landing gear retraction systems
 - brake and anti-skid systems
 - nosewheel steering systems
- fuel system and component layout, operation and characteristics (including electrical system interfaces) and system component operation and construction
- construction and operation of landing gear components, including:
 - wheel assemblies
 - skids
 - floats
 - struts/oleos
 - uplocks and downlocks
 - mechanical linkages
- how to configure the aircraft for inspection, testing and troubleshooting of hydraulic, fuel and landing gear systems and components
- maintenance requirements and troubleshooting procedures
- relevant WHS practices relating to hydraulic systems, fuel systems and landing gear components, including lifting and handling of heavy items
- how to obtain MSDS
- selection and use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action.

- The work plan should take account of applicable safety (including safe handling of heavy components) and quality requirements in accordance with the industry and regulatory standards.
- The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on each type of system:
 - hydraulic systems
 - fuel systems
 - retraction systems
 - steering systems
 - brake systems, including anti-skid, where applicable
- and on at least one (1) component from each of the following groups:
 - hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators, direct reading gauges
 - fuel system filters, valves, pumps, rigid and flexible storage cells/tanks
 - rigid and flexible pipelines, hoses and fittings
 - wheel assemblies, skids and floats
 - brake units
 - struts/oleos.
- Where the aircraft is rotary wing and is fitted with skids or floats, coverage of retraction systems, steering systems and brake systems and their components is not required. Where a rotary wing aircraft is fitted with a fixed undercarriage with wheels, coverage of retraction and steering systems and their components is not required.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, standard trade practices and systems knowledge in the inspection, testing and troubleshooting of both fixed and rotary wing aircraft pneumatic systems and components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA303 Remove and install aircraft pneumatic system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.	demonstrate achievement of the element.
1. Inspect pneumatic systems and components	1.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with specified procedures 1.2 Pneumatic system is visually or physically checked for external signs of defects in accordance with specified procedures while observing all relevant work health and safety (WHS) requirements
2. Test pneumatic systems	2.1 The aircraft and pneumatic systems are correctly prepared in accordance with specified procedures for the application of power 2.2 Power is applied and system functionally tested in accordance with specified procedures for evidence of malfunction or leaks 2.3 System calibration or adjustments are performed in accordance with specified procedures
3. Prepare for troubleshooting	3.1 Relevant maintenance documentation and modification status, including system defect/service difficulty reports, where relevant, are interpreted to identify an unserviceability
4. Troubleshoot pneumatic systems	4.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination 4.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level 4.3 Specialist advice is obtained, where required, to assist with the troubleshooting process 4.4 Pneumatic system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required 4.5 Fault rectification requirements are determined to assist in planning the repair or adjustment

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Pneumatic systems include:**
- De-icing
 - Air cycle air conditioning
 - Pressurisation
 - Fire-extinguishing
- Components of pneumatic systems include:**
- Filters, valves, pumps, motors, actuators and regulators
 - Gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers
 - Heat exchangers, pressure vessels, condensers, compressors, expansion turbines and humidifiers
 - Rigid and flexible pipelines, hoses and fittings
 - Ducting
- Electrical interface includes:**
- Associated electrical loom terminations and/or plugs
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA310C Inspect, test and troubleshoot aircraft pneumatic systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills and tools in the inspection, adjustment and troubleshooting of pneumatic systems
- using hand skills and tools in the inspection, adjustment and troubleshooting of pneumatic system components
- using maintenance manuals to prepare the aircraft for inspection, testing and troubleshooting of pneumatic systems and components
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- recognising external defects in pneumatic systems and components
- applying standard procedures
- observing all relevant WHS practices.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft pneumatic systems and their components. It is essential that system test procedures take into account all safety precautions applicable to the system being maintained, especially where system operation/switching interrelates to other systems being maintained.

Ability to interpret system performance specifications (allowable limits) and apply them in practice is critical and shall be demonstrated through application across the range of systems listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- pneumatic system:
 - layout
 - operation and characteristics

- component operation and construction
- electrical and instrument system interfaces
- how to configure the aircraft for inspection, testing and troubleshooting of pneumatic systems and components
- pneumatic system maintenance requirements and troubleshooting procedures
- WHS procedures relating to pneumatic systems and components
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including those relating to the handling and control of halon fire-extinguishers.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on each type of system:
 - de-icing
 - air cycle air conditioning
 - pressurisation
 - fire-extinguishing
- and on at least one (1) component from each of the following groups:
 - filters, valves, pumps, motors, actuators and regulators
 - gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers
 - heat exchangers, pressure vessels, condensers, compressors, expansion turbines and humidifiers
 - rigid and flexible pipelines, hoses and fittings
 - ducting.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA355 Maintain light aircraft air cycle air conditioning systems, and/or MEA356 Maintain light piston engine aircraft pressurisation systems will have satisfied the requirements of this unit with regard to common Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to MEA355 Maintain light aircraft air cycle air conditioning systems, and/or MEA356 Maintain light piston engine aircraft pressurisation systems may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA312 Inspect, test and troubleshoot aircraft fixed wing flight control systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications and knowledge of system theory to inspect, test and troubleshoot fixed wing aircraft flight control system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

This unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA305 Remove and install aircraft fixed wing flight control system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.	demonstrate achievement of the element.
1. Inspect fixed wing flight control systems and components	<p>1.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with applicable maintenance manual</p> <p>1.2 Fixed wing flight control systems and components are visually or physically checked for signs of defects in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements</p>
2. Test fixed wing flight control systems	<p>2.1 Powered controls of the aircraft and system are prepared in accordance with maintenance manual for the application of electrical and hydraulic power</p> <p>2.2 Power is applied, if necessary, and system is functionally tested in accordance with applicable maintenance manual for malfunction or evidence of incorrect rigging</p> <p>2.3 System rigging is performed in accordance with applicable maintenance manual</p>
3. Prepare for troubleshooting	<p>3.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are interpreted to identify an unserviceability</p>
4. Troubleshoot fixed wing flight control systems	<p>4.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination</p> <p>4.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level</p> <p>4.3 Specialist advice is obtained, where required, to assist with the troubleshooting process</p> <p>4.4 Fixed wing flight control system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required</p> <p>4.5 Fault rectification requirements are determined to assist in planning the repair</p>

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Flight control systems and system components include:

- Elevator, aileron and rudder primary flight control systems and associated trim systems
- Speed brake, spoiler, flap and high lift systems
- Ailerons, elevators, rudders, trim tabs, speed brakes, spoilers, flaps and slats
- Actuators – mechanical, hydraulic, pneumatic or electric
- Mechanical flight control components (cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks, wheels or columns, trim wheels or handles, and rudder pedals)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA312C Inspect, test and troubleshoot aircraft fixed wing flight control systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA312 Inspect, test and troubleshoot aircraft fixed wing flight control systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using relevant maintenance documentation and aircraft manuals to:
 - recognise defects during visual inspection of fixed wing flight control systems and system components
 - rig fixed wing flight control systems
 - functionally test the operation of fixed wing flight control systems and recognise system/component malfunction or evidence of incorrect rigging
- to the extent permitted by applicable fault diagnosis guides, troubleshooting unserviceabilities in fixed wing flight control systems and clearly recording the causes of the unserviceabilities.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with the aircraft fixed wing flight systems. It is essential that testing procedures take into account all safety precautions associated with flight control system operation, in particular where system operation/switching interrelates to other systems being maintained, and that an awareness be demonstrated of dual inspection requirements associated with work on flight controls and systems.

Ability to interpret system performance specifications (allowable limits) and apply them in practice is critical and shall be demonstrated through application across the range of systems listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS precautions relevant to flight control system maintenance
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components
- flight control system layout and operation:

- theory of flight:
 - airflow
 - conditions of flight
 - lift and forces
 - drag
 - wings, tailplane and vertical stabiliser
 - lift augmentation (flaps, slats and slots)
 - aircraft control surfaces and their function (elevator, ailerons, rudder, elevons and trim tabs)
 - spoilers and speed brakes
 - flight control balancing and flutter
 - stability and control and flight control rigging
- mechanical system layout and operation:
 - cockpit controls
 - cables and cable tensioning
 - pulleys and fairleads
 - bellcranks
 - levers
 - control surface horns
 - screwjacks
 - push/pull rods
- powered flight controls:
 - system layout and operation
 - component construction and operation
 - electrical and instrument interfaces:
 - flaps
 - trim
 - position indication
- flight control system maintenance procedures and troubleshooting methods
- flight control system interfaces with automatic pilot systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in aircraft maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.

- The application of ground testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- Assessment conditions must also provide for knowledge of dual inspection requirements to be demonstrated.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of:
 - elevator, aileron and rudder primary flight control systems and associated trim systems
 - speed brake, spoiler, flap and high lift systems
 - ailerons, elevators, rudders, trim tabs, speed brakes, spoilers, flaps and slats
 - actuators – mechanical, hydraulic, pneumatic or electric
 - mechanical flight control components (cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks, wheels or columns, trim wheels or handles, and rudder pedals).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA313 Inspect, test and troubleshoot piston engine systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications, and knowledge of piston engine and system theory to inspect, test and troubleshoot fixed and rotary wing aircraft piston engines and engine system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA306 Remove and install engine systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

- | | |
|--|---|
| 1. Inspect piston engine system and components | 1.1 Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual |
| | 1.2 Piston engine and/or components are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 2. Test piston engine system | 2.1 Aircraft and engine system are correctly prepared in accordance with applicable maintenance manual and connected to appropriate test equipment |
| | 2.2 Built-in system test functions and status displays are activated, where applicable, outputs recorded and interpreted |
| | 2.3 Assistance is provided with engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual |
| 3. Prepare for troubleshooting | 3.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability |
| 4. Troubleshoot piston engine system | 4.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | 4.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 4.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 4.4 Piston engine system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required |
| | 4.5 Fault rectification requirements are determined to assist in planning the repair |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Piston engines and engine systems include:

- Engine (all types), main components and accessories/drives
- Control system, including full authority digital engine control (FADEC) (where FADEC is applicable to the enterprise)
- Ignition and starter systems
- Fuel, air systems and super/turbo chargers
- Oil system
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA313C Inspect, test and troubleshoot piston engine systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA313 Inspect, test and troubleshoot piston engine systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals
- through visual/physical inspection, recognising external and internal signs of defects in piston engines, components and system components
- assisting with testing of piston engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
- compiling engine condition monitoring records
- rigging and adjusting engine controls and systems, including FADEC (where FADEC is applicable to the enterprise)
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in piston engines and engine systems, clearly record details and identify the required rectification actions.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisor or other trades) associated with engine systems. It is essential that system testing procedures take into account all safety precautions associated with piston engine system operation, and that awareness be demonstrated of dual inspection requirements associated with work on engine controls. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This may be demonstrated through application across a number of engine system groups as listed in the Assessment Conditions. The application of testing procedures and functional rigging checks should also indicate knowledge of system operation.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS procedures associated with piston engine maintenance, including lifting and handling of heavy objects
- how to obtain MSDS

- use of PPE
- fault diagnosis techniques
- piston engine and engine system layout and operation:
 - four stroke engine theory of operation and performance
 - cylinder configurations
 - construction – components and materials
 - carburettors and air induction systems
 - fuel injection systems
 - fuels and their characteristics
 - ignition systems
 - lubricating systems and lubricants
 - cooling systems
 - exhaust systems
 - superchargers and turbochargers
 - accessory drives and mounts
 - controls and rigging of controls
 - FADEC systems
 - piston engine maintenance requirements and troubleshooting procedures including ground running of engines
- system component operation, including electrical and instrument system interfaces:
 - magnetos and ignition harnesses
 - spark plugs
 - fuel pumps
 - fuel filters
 - oil pumps
 - oil filters
 - oil tanks
 - vacuum pumps and air pumps
 - generators
 - starter motors
 - oil pressure gauges (direct reading)
 - temperature gauges (direct reading)
 - tachometers
 - manifold pressure gauges
 - system and component maintenance requirements and troubleshooting procedures
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in aircraft maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out rigging checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- Testing of engines fitted to helicopters (where auxiliary drive is not available) may be carried out through the applicant directing a pilot qualified on type.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - engine (all types), main components and accessories/drives
 - control system, including FADEC (where FADEC is applicable to the enterprise)
 - ignition and starter systems
 - fuel, air systems and super/turbo chargers
 - oil system.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA353 Maintain basic light aircraft engines and propellers will have satisfied the requirements of this unit with regard to common Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to MEA353 Maintain basic light aircraft engines and propellers may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA314 Inspect, test and troubleshoot gas turbine engine systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications, and knowledge of gas turbine engine and system theory to inspect, test and troubleshoot fixed and rotary wing aircraft gas turbine engines and engine system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA306 Remove and install engine systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

- | | |
|---|---|
| 1. Inspect gas turbine engine system and components | 1.1 Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual |
| | 1.2 Gas turbine engine and/or component are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 2. Test gas turbine engine system | 2.1 Aircraft and gas turbine engine system are correctly prepared in accordance with applicable maintenance manual and connected to appropriate test equipment |
| | 2.2 Built-in system test functions and status displays are activated, where applicable, outputs recorded and interpreted |
| | 2.3 Assistance is provided with gas turbine engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual |
| 3. Prepare for troubleshooting | 3.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify an unserviceability |
| 4. Troubleshoot gas turbine engine system | 4.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | 4.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 4.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 4.4 Gas turbine engine system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required |
| | 4.5 Fault rectification requirements are determined to assist in planning the repair |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Gas turbine engine and/or systems include:

- Engine change unit, main components and accessories/drives
- Control system
- Ignition and starter systems
- Fuel system
- Oil system
- Air system

Procedures and requirements Include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA314C Inspect, test and troubleshoot gas turbine engine systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA314 Inspect, test and troubleshoot gas turbine engine systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including lifting and handling of heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
 - through visual/physical inspection, recognise external and internal signs of defects in gas turbine engines, components and system components
 - assist with testing of gas turbine engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
 - compile engine condition monitoring records
 - rig and adjust engine controls and systems
- using fault diagnosis guides and equivalent data, accurately and efficiently to troubleshoot the causes of unserviceabilities in gas turbine engines and engine systems, clearly record details and identify the required rectification actions.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisor or other trades) associated with engine systems. It is essential that system test procedures take into account all safety precautions associated with gas turbine engine system operation, especially with regard to high energy ignition units, and that awareness be demonstrated of dual inspection requirements associated with work on engine control systems.

This shall be demonstrated through application across a number of engine system groups as listed in the Assessment Conditions. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures and functional rigging checks should also indicate knowledge of system operation.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- fault diagnosis techniques

- gas turbine engine layout and operation:
 - types of gas turbine
 - operating principles and power output
 - gas path
 - intakes
 - compressors
 - combustion chambers
 - turbines
 - exhaust
 - thrust reversers
 - accessory drives
 - bearings and seals
 - maintenance requirements and troubleshooting procedures
- system and component operation, including electrical and instrument system interfaces:
 - fuel control and fuels
 - lubrication and lubricants
 - air distribution
 - starting
 - ignition
 - power augmentation
 - instrumentation:
 - performance indication
 - condition indication
 - warning
 - presentation and interpretation of electronic displays
 - fire warning and extinguishing
 - control system and rigging of engine controls
- engine spin/run procedures, including the operation of auxiliary power units (APUs)
- engine condition monitoring
- relevant WHS practices including the requirements for the lifting and handling of heavy components
- how to obtain MSDS
- selection and use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in aircraft maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out rigging checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- Testing of engines fitted to helicopters (where auxiliary drive is not available) may be carried out through the applicant directing a pilot qualified on type.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - engine change unit, main components and accessories/drives
 - control system
 - ignition and starter systems
 - fuel system
 - oil system
 - air system.
- This shall be established via the records in the Log of Industrial Experience and Achievement, or where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA315 Inspect, test and troubleshoot propeller systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications, and knowledge of propeller and propeller system theory to inspect, test and troubleshoot fixed wing aircraft propellers and propeller system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA307 Remove and install propeller systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

- | | |
|---|--|
| 1. Inspect propeller systems and components | 1.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with applicable maintenance manual |
| | 1.2 Propeller system is visually or physically checked for rigging and external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 2. Test propeller systems | 2.1 Aircraft and system are correctly prepared, in accordance with maintenance manual, for the operation of engine and propeller system |
| | 2.2 Propeller and system are functionally tested in accordance with applicable maintenance manual for evidence of malfunction or defects |
| | 2.3 System calibration or adjustments are performed in accordance with applicable maintenance manual |
| 3. Prepare for troubleshooting | 3.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are interpreted to identify an unserviceability |
| 4. Troubleshoot propeller systems | 4.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | 4.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 4.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 4.4 Propeller system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required |
| | 4.5 Fault rectification requirements are determined to assist in planning the repair |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Propeller and propeller systems include:

- Propellers, including spinners, where fitted
- Constant speed, feathering and reversing propeller drives
- Beta control systems and governors
- Controls and linkages
- De-ice/anti-ice equipment (where applicable to the enterprise)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA315C Inspect, test and troubleshoot propeller systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA315 Inspect, test and troubleshoot propeller systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the lifting and handling of heavy components
- using relevant maintenance documentation and aircraft manuals to:
 - recognise, through visual/physical inspection, external signs of defects or rigging abnormalities in propellers and propeller system components
 - functionally test propellers and propeller systems and recognise any indication of malfunction or incorrect rigging or adjustment
 - rig and adjust propeller controls and systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in propellers and propeller systems, clearly record details and identify the required rectification actions.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with propeller systems. It is essential that system test procedures take into account all safety precautions associated with propeller system operation, and that awareness be demonstrated of dual inspection requirements associated with work on propeller control systems.

This shall be demonstrated through application across a number of propeller systems or propeller types. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- fault diagnosis techniques
- propeller system layout and operation:
 - propeller types
 - propeller terminology
 - forces acting on a propeller

- propeller construction
- propeller operation
- pitch changing mechanisms
- governors and beta control
- controls and rigging of propeller controls
- maintenance requirements and troubleshooting procedures
- ancillary systems and system component operation, including electrical and instrument system interfaces:
 - de-icing and anti-icing
 - multi-engine synchronising and synchrophasing
 - feathering and unfeathering, including auto feathering
 - pitch reversal
 - negative torque sensing and protection
 - de-coupling
 - braking
 - thrust and torque measuring and indication
 - maintenance requirements and troubleshooting procedures
- relevant WHS practices, including the requirements for the lifting and handling of heavy components
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. System operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - propellers, including spinners, where fitted
 - constant speed, feathering and reversing propeller drives
 - beta control systems and governors

- controls and linkages
- de-ice/anti-ice equipment (may be omitted where it is not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA316 Inspect, test and troubleshoot rotary wing rotor and control systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications, and knowledge of rotors and rotor control system theory to inspect, test and troubleshoot rotary wing aircraft rotors and rotor control systems during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA308 Remove and install rotary wing rotor and flight control system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

- | | |
|---|--|
| 1. Inspect rotor and rotor control systems and components | 1.1 Isolation and warning signs are fitted/installed to the system or related systems and the aircraft configured for safe system inspection and operation in accordance with relevant aircraft publications/maintenance regulations orders and standards and practices |
| | 1.2 Rotor and rotor control system is visually or physically checked/inspected for external signs of defects in accordance with relevant aircraft publications maintenance regulations/orders and standards and practices while observing all relevant work health and safety (WHS) requirements |
| | 1.3 Defects are identified and recorded in accordance with standard enterprise procedures |
| 2. Ground test rotor and rotor control systems | 2.1 Aircraft and system prepared in accordance with relevant aircraft publications/maintenance regulations orders and standards and practices for the operation of engine and rotor system |
| | 2.2 Rotor and rotor control system are functionally tested in accordance with relevant aircraft publications maintenance regulations/orders and standards and practices for evidence of malfunction |
| | 2.3 System calibration or adjustments are performed in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices |
| 3. Prepare for troubleshooting | 3.1 Relevant aircraft publications and modification status, including system defect reports, are interpreted to identify an unserviceability |
| 4. Troubleshoot rotor and rotor control systems | 4.1 Available information from aircraft maintenance documentation, inspection and test results is used to assist in fault determination |
| | 4.2 Relevant aircraft publication fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 4.3 Specialist advice is obtained to assist with the troubleshooting process |
| | 4.4 Rotor and rotor control system faults are located and the causes of the faults are clearly identified and recorded in |

aircraft maintenance documentation in accordance with standard enterprise procedures

4.5 Fault rectification requirements are determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Rotor and rotor control systems include:

- Main rotor blades and tail rotor blades
- Rotor heads, swash plates and tail rotor pitch control assemblies
- Mechanical, powered flight control components
- Main rotor, intermediate or tail rotor gearboxes
- Drive shafts and couplings

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA316C Inspect, test and troubleshoot rotary wing rotor and control systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA316 Inspect, test and troubleshoot rotary wing rotor and control systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using relevant maintenance documentation and aircraft manuals to:
 - recognise through visual/physical inspection external signs of defects in the rotor, rotor head, tail rotor and flight control mechanical system components
 - ground test the rotor and control system and recognise correct function
 - rig and adjust rotor controls and systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in rotor control systems, clearly record details and identify the required rectification actions.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with the rotor control systems. It is essential that testing procedures take into account all safety precautions associated with ground testing of rotor and rotor control systems, and that awareness be demonstrated of dual inspection requirements associated with work on control systems.

Ability to interpret system performance specifications (allowable limits) and apply them in practice is critical and shall be demonstrated through application across the range of systems listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- fault diagnosis techniques
- standard trade practices relating to tool and test/rigging equipment usage
- theory of flight:
 - airflow
 - conditions of flight

- lift and forces
- drag
- rotary flight principles:
 - terminology relating to:
 - aerofoils
 - main rotor blades
 - rotor discs
 - rotors – main and tail
 - aerodynamic characteristics:
 - aerofoil design
 - forces
 - rotor thrust and power requirements
 - vortex ring
 - autorotation
 - helicopter stability
- helicopter dynamic components:
 - main rotors:
 - blades
 - heads
 - linkages
 - tail rotors
 - swash plates
 - transmissions and drive shafts
 - clutches and freewheeling units
- system and component operation, including electrical and instrument system interfaces:
 - cyclic pitch control
 - collective pitch control
 - tail rotor control
 - mechanical and powered control systems
 - engine control interface
 - torque reaction and anti-torque devices
 - engine indication
 - vibration monitoring
- helicopter maintenance procedures and troubleshooting
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures including requirements for engine and rotor system operation
- relevant WHS practices.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in aircraft maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The application of ground testing procedures should clearly indicate knowledge of system operation. System operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- Functional testing of rotors and rotor control systems with engine/s running may be carried out with the applicant directing a pilot qualified on type.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - main rotor blades and tail rotor blades
 - rotor heads, swash plates and tail rotor pitch control assemblies
 - mechanical, powered flight control components
 - main rotor, intermediate or tail rotor gearboxes
 - drive shafts and couplings.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA352 Maintain basic rotary wing aircraft systems will have satisfied the requirements of this unit with regard to common Range of Conditions variables. The Log of Industrial Experience and Achievement records relating to MEA352 Maintain basic rotary wing aircraft systems may be accepted as also meeting the evidence requirements for this unit in the applicable common areas.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA317 Remove and install pressurised aircraft structural and non-structural components

Modification History

Release 2 – MEA369 Inspect and maintain structure and related components of non-pressurised small aircraft included as an optional pre-requisite.

Application

This unit of competency requires application of hand skills and maintenance publications to remove and install structural and non-structural components from fixed wing aircraft with pressurised cabins during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway and may also be part of a Structures Maintenance Certificate IV training pathway

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA369 Inspect and maintain structure and related components of non-pressurised small aircraft

OR

MEA302 Remove and install aircraft hydro-mechanical and landing gear system components

AND

MEA303 Remove and install aircraft pneumatic system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-----------------------|--|
| 1. Remove components | 1.1 Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage to aircraft or component during component removal |
| | 1.2 Component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| | 1.4 Removed components are tagged and prepared for transport in accordance with specified procedures |
| 2. Install components | 2.1 Structural components to be installed are checked to confirm correct part numbers, serviceability and modification status |
| | 2.2 Component installation is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 2.3 Support/safety equipment is removed at an appropriate time to ensure personnel safety and freedom from structural damage |
| | 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Removable components of structure include:

- Those that are installed using bolts and/or screws. Where component removal and installation requires the removal and installation of rivets the applicable unit is either MEA339 Inspect, repair and maintain aircraft structures, MEA370 Repair the structure of non-pressurised small aircraft or MEA371 Perform major repairs and modifications to small aircraft metal structure.
- Structural components include:
 - removable components of wings, pylons, empennage, landing gear support structure, fairings, nacelles and thrust reversers
 - removable components or sections of pressurised aircraft fuselage
 - pressurised fuselage entry, cargo, access doors and associated pressure seals
 - pressurised fuselage windows, transparent panels and associated seals
 - trim panels, linings, seats, cabin equipment and consoles, floor panels and coverings (where applicable to the enterprise)
 - applicable emergency and safety equipment, including passenger escape systems, inflatable, slides, life jackets, rafts, location transmitters, beacons, and crew and/or passenger seat restraints

Installation includes:

- Checking and adjustment of all doors and access panels, including locking mechanisms, for correct fit and sealing

Sealant removal and application includes:

- The removal and application of faying (contact or overlapping) surface, pressure hull and fuel tank sealants (where applicable to the enterprise)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 2 – MEA369 Inspect and maintain structure and related components of non-pressurised small aircraft included as an optional pre-requisite. Equivalent.

Release 1 – equivalent to MEA317C Remove and install pressurised aircraft structural and non-structural components

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA317 Remove and install pressurised aircraft structural and non-structural components

Modification History

Release 2 – MEA369 Inspect and maintain structure and related components of non-pressurised small aircraft included as an optional pre-requisite.

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
 - remove structural components
 - install structural components
 - remove doors, door seals, windows and transparent panels
 - install doors, door seals, windows and transparent panels
- checking and adjusting all doors and access panels, including locking mechanisms and ensuring effective sealing.

The underlying skills inherent in this unit should be transferable to other units that require similar techniques. It is essential that shoring, trestling and lifting requirements and safety precautions applicable to the structure being maintained are fully observed, understood and complied with.

This may be demonstrated through application across a representative range of the component groups listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- structural component methods of construction and attachment
- faying surface treatment and fuel tank and pressure hull sealing
- aircraft doors and related seals
- window and transparent panel construction, attachment methods and sealing
- aircraft interior fittings (trim, linings, seats, floor panels, and so on) construction and attachment methods
- the location and attachment or stowage methods for emergency equipment:
 - passenger escape systems

- inflatable slides
- life jackets
- life rafts
- location transmitters, beacons
- crew and/or passenger seat restraints
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- relevant WHS practices
- how to obtain MSDS
- use of PPE.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of component handling, attachment methods, adjustment and sealing as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - removable components of wings, pylons, empennage, landing gear support structure, fairings, nacelles and thrust reversers
 - removable components or sections of pressurised aircraft fuselage
 - pressurised fuselage entry, cargo, access doors and associated pressure seals
 - pressurised fuselage windows, transparent panels and associated seals
 - trim panels, linings, seats, cabin equipment and consoles, floor panels, coverings (items may be omitted where not applicable to the enterprise)
 - applicable emergency and safety equipment, including passenger escape systems, inflatable, slides, life jackets, rafts, location transmitters, beacons, and crew and/or passenger seat restraints.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA318 Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, standard trade practices and systems knowledge in the inspection of aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components of fixed wing aircraft during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Aircraft Maintenance Engineer (AME) Certificate IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA302	Remove and install aircraft hydro-mechanical system and landing gear components
MEA303	Remove and install aircraft pneumatic system components
MEA305	Remove and install aircraft fixed wing flight control system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Inspect hydro-mechanical systems and components | 1.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with specified procedures |
| | 1.2 Hydro-mechanical system and system components are visually or physically checked for external signs of defects in accordance with specified procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 2. Inspect landing gear systems and components | 2.1 Isolation tags already attached to the system or related systems are checked and aircraft configured, including jacking, where necessary, for safe system inspection and operation in accordance with specified procedures |
| | 2.2 Landing gear system and system components are visually or physically checked for external signs of defects in accordance with specified procedures while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| 3. Inspect gaseous systems and components | 3.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with specified procedures |
| | 3.2 Gaseous system and system components are visually or physically checked for external signs of defects in accordance with specified procedures while observing all relevant WHS requirements |
| 4. Inspect mechanical systems and components | 4.1 Isolation tags already attached to the system or related systems are checked and aircraft configured for safe system inspection and operation in accordance with specified procedures |
| | 4.2 Mechanical system and system components are visually or physically checked for external signs of defects in accordance with specified procedures while observing |

all relevant WHS requirements

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Hydro-mechanical systems include:

- Hydraulic systems
- Fuel systems
-

Components of hydro-mechanical systems include:

- Hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges
- Fuel system filters, valves, pumps, and rigid and flexible storage cells/tanks
- Rigid and flexible pipelines, hoses and fittings

Landing gear systems include:

- Retraction systems
- Steering systems
- Brake systems, including anti-skid, where applicable

(components of landing gear retraction, steering and braking systems are covered by hydro-mechanical and mechanical system components)

Landing gear components include:

- Wheel assemblies
- Brake units
- Struts/oleos

Gaseous systems include:

- Pneumatic
- Air cycle air conditioning
- Pressurisation
- Fire-extinguishing

Gaseous system components include:

- Gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers
- Heat exchangers, pressure vessels, condensers,

- compressors, expansion turbines, humidifiers, valves and actuators
- Rigid and flexible pipelines and fittings
 - Ducting
- Mechanical systems include:**
- Mechanical operating and locking systems
 - Mechanical flight control systems or the mechanical elements of power-assisted flight control systems
- Mechanical system components include:**
- Cables, pulleys, guides, fairleads, tension regulators, chains and sprockets
 - Control rods, torque tubes, bellcranks, screwjacks, clutches, springs, bearings and gears
 - Control sticks, wheels, columns, trim wheels or handles, and rudder pedals
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA318C Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA318 Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all relevant WHS practices, including the use of MSDS and PPE
- using maintenance manuals and documentation to prepare the aircraft and identify requirements for inspection of hydraulic, fuel, gaseous, flight control, landing gear and mechanical systems and components
- using hand skills and tools in the inspection of hydraulic, fuel, flight control, gaseous and mechanical system components
- jacking of the aircraft, as required, for landing gear system inspection
- using hand skills and tools in the inspection of landing gear components
- recognising external defects in hydraulic, fuel, gaseous, flight control, landing gear and mechanical systems and components.

The underlying skills inherent in this unit should be transferable across a range of inspection applications (including the timely involvement of supervisors or other trades) associated with aircraft hydro-mechanical, gaseous, mechanical and landing gear systems and their components. It is essential that system/component inspection procedures take into account all safety precautions applicable to the system being maintained, especially where system operation/switching interrelates to other systems being maintained. Ability to interpret system performance specifications (allowable limits) and apply them in practice is critical and shall be demonstrated through application across the range of systems listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to recognise external defects in hydraulic, fuel, gaseous, flight control, landing gear and mechanical system components
- how to configure the aircraft for inspection of hydraulic, fuel, gaseous, flight control, landing gear and mechanical systems and components
- inspection and testing requirements for gears, springs and bearings

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- maintenance requirements
- relevant WHS practices relating to hydraulic, fuel, gaseous, flight control, landing gear and mechanical system components, including lifting and handling of heavy items
- how to obtain MSDS
- selection and use of PPE
- maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on each type of system and on at least one (1) component of each group listed in the Range of Conditions, as follows:
 - hydraulic systems – a system and at least one (1) component from each of the following groups:
 - hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges
 - rigid and flexible pipelines, hoses and fittings
 - fuel systems – a system and at least one (1) component from each of the following groups:
 - fuel system filters, valves, pumps, and rigid and flexible storage cells/tanks
 - rigid and flexible pipelines, hoses and fittings
 - landing gear systems – each system:
 - retraction systems
 - steering systems
 - brake systems, including anti-skid, where applicable
 - landing gear components – one (1) each of:
 - wheel assemblies
 - brake units
 - struts/oleos
 - gaseous systems – each listed system:

- pneumatic
- air cycle air conditioning
- pressurisation
- fire-extinguishing
- gaseous system components - at least one (1) component from each of the following groups:
 - gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers
 - heat exchangers, pressure vessels, condensers, compressors, expansion turbines, humidifiers, valves and actuators
 - rigid and flexible pipelines and fittings
 - ducting
- mechanical systems – a system applicable to each of system types:
 - mechanical operating and locking systems
 - mechanical flight control systems or the mechanical elements of power-assisted flight control systems
- mechanical system components - at least one (1) component from each of the following groups:
 - cables, pulleys, guides, fairleads, tension regulators, chains and sprockets
 - control rods, torque tubes, bellcranks, screwjacks, clutches, springs, bearings and gears
 - control sticks, wheels, columns, trim wheels or handles, and rudder pedals.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained the following related units will have met the Performance Criteria and Range of Conditions variables for Elements listed:
 - MEA309 Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components, for Element 1
 - MEA309 Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components, for Element 2, provided that the unit was attained on aircraft with retractable landing gear
 - MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components, for Element 3
 - MEA312 Inspect, test and troubleshoot aircraft fixed wing flight control systems and components, for Element 4.

- The Log of Industrial Experience and Achievement records relating to the listed units may be accepted as also meeting the evidence requirements for this unit in the applicable Elements. Advice in MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components regarding MEA355 Maintain light aircraft air cycle air conditioning systems, and MEA356 Maintain light piston engine aircraft pressurisation systems, may also be taken into consideration where applicable.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA319 Inspect gas turbine engine systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications, and knowledge of gas turbine engine and system theory to inspect gas turbine engines and engine system components of fixed and rotary wing aircraft.

The unit is part of the Mechanical Aircraft Maintenance Engineer (AME) Certificate IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA306 Remove and install engine system and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---------------------------|---|
| 1. Inspect gas turbine | 1.1 Isolation tags already attached to the system or related |
|---------------------------|---|

engine systems and components

systems are checked and aircraft configured for safe system inspection and operation in accordance with applicable maintenance manual

- 1.2 Gas turbine engine and/or components are visually or physically checked for external signs of defects in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Gas turbine engine and components include:

- Engine change unit, main components and accessories/drives
- Control system and major system components
- Ignition and starter systems and major system components
- Engine fuel system and major system components
- Oil system and major system components
- Air system and major system components
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA319C Inspect gas turbine engine systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA319 Inspect gas turbine engine systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including lifting and handling of heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
 - recognise through visual/physical inspection external and internal signs of defects/damage to gas turbine engine, components and system components
 - assist with testing of gas turbine engine and engine system operation.

The underlying skills inherent in this unit should be transferable across a range of inspection applications (including the timely involvement of supervisors or other trades) associated with gas turbine engines, components and systems. It is essential that inspection procedures take into account all safety precautions applicable to the system/component being maintained. Ability to interpret system performance specifications (allowable limits) and apply them in practice is critical and shall be demonstrated through application across the range of systems listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- gas turbine engine layout and operation:
 - intakes
 - compressors
 - combustion chambers
 - turbines
 - exhaust
 - thrust reversers
 - accessory drives
 - bearings and seals
 - maintenance requirements
- system and component operation, including electrical and instrument system interfaces:

- fuel control and fuels
- lubrication and lubricants
- air distribution
- starting
- ignition
- power augmentation
- instrumentation:
 - performance indication
 - condition indication
 - warning
 - presentation and interpretation of electronic displays
- fire warning and extinguishing
- control system
- engine spin/run procedures, including the operation of auxiliary power units (APUs)
- engine condition monitoring
- relevant WHS practices, including the requirements for the lifting and handling of heavy components
- how to obtain MSDS
- selection and use of PPE
- maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations and used to assist in the inspection process would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on each of the following systems and at least one (1) component of each system.
 - engine change unit, main components and accessories/drives
 - control system and major system components
 - ignition and starter systems and major system components
 - engine fuel system and major system components
 - oil system and major system components
 - air system and major system components.

- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA314 Inspect, test and troubleshoot gas turbine engine systems and components, will have fully met the criteria for this unit. Log of Industrial Experience and Achievement records relating to MEA314 Inspect, test and troubleshoot gas turbine engine systems and components may be accepted as also meeting the evidence requirements for this unit.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA320 Test and troubleshoot aircraft hydro-mechanical, gaseous and landing gear systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, standard trade practices, and systems knowledge in the testing and troubleshooting of aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components of fixed wing aircraft during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Aircraft Maintenance Engineer (AME) Certificate IV (Aircraft Maintenance Stream) training pathways and must be taken with MEA318 Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA318 Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Prepare for troubleshooting | 1.1 Relevant maintenance documentation and modification status, including system defect/service difficulty reports, where relevant, are interpreted to identify an unserviceability |
| 2. Test hydro-mechanical, mechanical, gaseous and landing gear systems and components | 2.1 The aircraft and hydro-mechanical, mechanical, gaseous and landing gear systems are correctly prepared in accordance with specified procedures for the application of power

2.2 Power is applied and system and components functionally tested in accordance with specified procedures for evidence of malfunction or leaks while applying all relevant work health and safety (WHS) procedures

2.3 System calibration or adjustments are performed in accordance with specified procedures |
| 3. Troubleshoot hydro-mechanical, mechanical, gaseous and landing gear systems and components | 3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination

3.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level

3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4 Hydro-mechanical, mechanical, gaseous and landing gear system and component faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

3.5 Fault rectification requirements are determined to assist in planning the repair or adjustment |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Hydro-mechanical systems include:

- Hydraulic systems
- Fuel systems

Components of hydro-mechanical systems include:

- Hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges
- Fuel system filters, valves, pumps, rigid and flexible storage cells/tanks
- Rigid and flexible pipelines, hoses and fittings

Landing gear systems include:

- Retraction systems
- Steering systems
- Brake systems, including anti-skid, where applicable

(components of landing gear retraction, steering and braking systems are covered by hydro-mechanical and mechanical system components)

Landing gear components include:

- Wheel assemblies
- Brake units
- Struts/oleos

Gaseous systems include:

- Pneumatic
- Air cycle air conditioning
- Pressurisation
- Fire-extinguishing

Gaseous system components include:

- Gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers
- Heat exchangers, pressure vessels, condensers, compressors, expansion turbines, humidifiers, valves and actuators
- Rigid and flexible pipelines and fittings
- Ducting

- Mechanical systems include:**
- Mechanical operating and locking systems
- Mechanical system components include:**
- Cables, pulleys, guides, fairleads, tension regulators, chains and sprockets
 - Push/pull rods, torque tubes, bellcranks, screwjacks, clutches, springs, bearings and gears
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA320C Test and troubleshoot aircraft hydro-mechanical, gaseous and landing gear systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA320 Test and troubleshoot aircraft hydro-mechanical, gaseous and landing gear systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all relevant WHS procedures
- using maintenance manuals to prepare the aircraft for testing and troubleshooting of hydraulic, fuel, gaseous, landing gear and mechanical systems and components
- using hand skills, tools and systems knowledge in the testing, adjustment and troubleshooting of hydraulic, fuel, gaseous, mechanical and landing gear systems
- using hand skills, tools and component knowledge in the adjustment and troubleshooting of hydraulic, fuel, gaseous and mechanical system components
- jacking of the aircraft, as required, for landing gear system testing, rigging and troubleshooting
- using hand skills, tools and system/component knowledge in the adjustment and troubleshooting of landing gear components
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process
- recognising external defects in hydro-mechanical, gaseous, mechanical and landing gear systems and components.

The underlying skills inherent in this unit should be transferable across a range of testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft hydro-mechanical, gaseous, mechanical and landing gear systems and their components. It is essential that system test procedures take into account all safety precautions applicable to the system being maintained, especially where system operation/switching interrelates to other systems being maintained.

Ability to interpret system performance specifications (allowable limits) and apply them in practice is critical and shall be demonstrated through application across the range of systems listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- hydraulic, fuel, gaseous, mechanical and landing gear system layout, operation and characteristics and system component operation and construction, including electrical system interfaces
- how to configure the aircraft for testing and troubleshooting of hydraulic, fuel, gaseous, mechanical and landing gear systems and components
- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- fluid power theory
- hydraulic system layout, operation and characteristics (including electrical and instrument system interfaces) and system component construction and operation for:
 - landing gear retraction systems
 - brake and anti-skid systems
 - nose wheel steering systems
- fuel system and component layout, operation and characteristics (including electrical system interfaces) and system component operation and construction
- gaseous (pneumatic, air conditioning, pressurisation and fire-extinguishing system and component layout, operation and characteristics (including electrical and instrument interfaces) and system component operation and construction
- construction and operation of landing gear components, including:
 - wheel assemblies
 - struts/oleos
 - uplocks and downlocks
- mechanical systems and linkages, including those related to the above systems
- how to configure the aircraft for inspection, testing and troubleshooting of hydraulic, fuel, gaseous and landing gear systems and components
- maintenance requirements and troubleshooting procedures
- relevant WHS practices relating to hydraulic, fuel, gaseous, mechanical and landing gear systems and components, including lifting and handling of heavy items
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using procedures, tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the approved aerospace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on each type of system and on at least one (1) component of each group, as follows:
 - hydraulic systems – a system and at least one (1) component from each of the following hydro-mechanical system component groups:
 - hydraulic accumulators, filters, reservoirs, valves, pumps, motors, actuators, regulators and direct reading gauges
 - rigid and flexible pipelines, hoses and fittings
 - fuel systems – a system and at least one (1) component from each of the following fuel system component groups:
 - fuel system filters, valves, pumps, rigid and flexible storage cells/tanks
 - rigid and flexible pipelines, hoses and fittings
 - landing gear systems – each of the following systems:
 - retraction systems
 - steering systems
 - brake systems, including anti-skid, where applicable
 - landing gear components – one (1) each of:
 - wheel assemblies
 - brake units
 - struts/oleos
 - gaseous systems – each of the following systems:
 - pneumatic
 - air cycle air conditioning
 - pressurisation
 - fire-extinguishing
 - gaseous system components - at least one (1) component from each of the following gaseous system component groups:
 - gauges (direct reading), temperature sensors, pressurisation controllers and temperature controllers
 - heat exchangers, pressure vessels, condensers, compressors, expansion turbines, humidifiers, valves and actuators
 - rigid and flexible pipelines and fittings
 - ducting
 - mechanical systems – a mechanical operating and locking system and at least one (1) component from each of the following mechanical system component groups:
 - cables, pulleys, guides, fairleads, tension regulators, chains and sprockets
 - push/pull rods, torque tubes, bellcranks, screwjacks, clutches, springs, bearings and gears.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained the following related units will have met the Performance Criteria and Range of Conditions variables for Elements listed:
 - Element 1 – any one of MEA309 Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear system and components, or MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components
 - Elements 2 and 3 – MEA309 Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear system and components, for hydro-mechanical system variables, and MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components, for gaseous system variables.
- The Log of Industrial Experience and Achievement records relating to the listed units may be accepted as also meeting the evidence requirements for this unit in the applicable Elements for systems and components as listed in the Range of Conditions variables. Advice in MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components, regarding MEA355 Maintain light aircraft air cycle air conditioning systems, and MEA356 Maintain light piston engine aircraft pressurisation systems, may also be taken into consideration where applicable.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA321 Test and troubleshoot aircraft fixed wing flight control systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications and knowledge of system theory to test and troubleshoot aircraft flight control systems and components of fixed wing aircraft during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Aircraft Maintenance Engineer (AME) Certificate IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA318 Inspect aircraft hydro-mechanical, mechanical gaseous and landing gear systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.	demonstrate achievement of the element.
1. Prepare for troubleshooting	1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are interpreted to identify an unserviceability
2. Test fixed wing flight control systems	2.1 Powered controls of the aircraft and system are prepared in accordance with maintenance manual for the application of electrical and hydraulic power
	2.2 Power is applied, if necessary, and system is functionally tested in accordance with applicable maintenance manual for malfunction or evidence of incorrect rigging while observing all relevant work health and safety (WHS) requirements
	2.3 System rigging is performed in accordance with applicable maintenance manual
3. Troubleshoot fixed wing flight control systems	3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination
	3.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level
	3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4 Fixed wing flight control system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Fixed wing flight control systems and components include:

- Ailerons, elevators, rudders, trim tabs, speed brakes, spoilers, flaps and slats
- Actuators – mechanical, hydraulic, pneumatic or electric
- Mechanical flight control components, including cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks (or wheels or columns), trim wheels or handles, and rudder pedals

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA321C Test and troubleshoot aircraft fixed wing flight control systems and components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA321 Test and troubleshoot aircraft fixed wing flight control systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all relevant WHS procedures
- using relevant maintenance documentation and aircraft manuals to:
 - recognise defects during visual inspection of fixed wing flight control systems and system components
 - rig fixed wing flight control systems
 - functionally test the operation of fixed wing flight control systems and recognise system/component malfunction or evidence of incorrect rigging
 - to the extent permitted by applicable fault diagnosis guides, troubleshooting unserviceabilities in fixed wing flight control systems and clearly record the causes of the unserviceabilities.

The underlying skills inherent in this unit should be transferable across a range of testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with the aircraft fixed wing flight systems. It is essential that testing procedures take into account all safety precautions associated with flight control system operation, in particular where system operation/switching interrelates with other systems being maintained, and that knowledge be demonstrated of dual inspection requirements associated with work on flight controls and systems.

This shall be demonstrated through application across the system/component groups listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS precautions relevant to flight control system maintenance
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components
- flight control system layout and operation:
- theory of flight:
 - airflow

- conditions of flight
- lift and forces
- drag
- wings, tailplane and vertical stabiliser
- lift augmentation (flaps, slats and slots)
- aircraft control surfaces and their function (elevator, ailerons, rudder, elevons and trim tabs)
- spoilers and speed brakes
- flight control balancing and flutter
- stability and control and flight control rigging
- mechanical system layout and operation:
 - cockpit controls
 - cables and cable tensioning
 - pulleys and fairleads
 - bellcranks
 - levers
 - control surface horns
 - screwjacks
 - push/pull rods
- powered flight controls:
 - system layout and operation
 - component construction and operation
 - electrical and instrument interfaces:
 - flaps
 - trim
 - position indication
- flight control system maintenance procedures and troubleshooting methods
- flight control system rigging equipment and procedures
- flight control system interfaces with automatic pilot systems and automatic flight control systems
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in aircraft maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.

- The application of ground testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - ailerons, elevators, rudders, trim tabs, speed brakes, spoilers, flaps and slats
 - actuators – mechanical, hydraulic, pneumatic or electric
 - mechanical flight control components including cables, pulleys, guides, fairleads, tension regulators, control rods, bellcranks, torque tubes, chains, sprockets, control sticks (or wheels or columns), trim wheels or handles, and rudder pedals.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA312 Inspect, test and troubleshoot aircraft fixed wing flight control systems and components, will have met the requirements for the Performance Criteria for Element 1. The requirements for Elements 2 and 3 will also be met if recorded experience for MEA312 Inspect, test and troubleshoot aircraft fixed wing flight control systems and components involved aircraft with powered flight controls. If experience was gained on aircraft types with only mechanical flight controls the recorded experience will partially meet the requirements for this unit. The Log of Industrial Experience and Achievement records relating to MEA312 Inspect, test and troubleshoot aircraft fixed wing flight control systems and components may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA322 Test and troubleshoot gas turbine engine systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications, and knowledge of gas turbine engine and system theory to test and troubleshoot gas turbine engines and engine system components of fixed and rotary wing aircraft during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Aircraft Maintenance Engineer (AME) Certificate IV training pathways and must be taken with MEA319 Inspect gas turbine engine systems and components.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA319 Inspect gas turbine engine systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Prepare for troubleshooting | 1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are interpreted to identify an unserviceability |
| 2. Test gas turbine engine system | 2.1 Aircraft and gas turbine engine system are correctly prepared in accordance with applicable maintenance manual and connected to appropriate test equipment while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)

2.2 Built-in system test functions and status displays are activated, where applicable, outputs recorded and interpreted

2.3 Assistance is provided with gas turbine engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual |
| 3. Troubleshoot gas turbine engine system | 3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination

3.2 Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level

3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process

3.4 Gas turbine engine system faults are located and causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required

3.5 Fault rectification requirements are determined to assist in planning the repair or adjustment |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Gas turbine engine systems include:

- Engine change unit, main components and accessories/drives
 - Control system
 - Ignition and starter systems
 - Fuel system
 - Oil system
 - Air system
- Procedures and requirements include:
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA322C Test and troubleshoot gas turbine engine systems and components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA322 Test and troubleshoot gas turbine engine systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including lifting and handling of heavy components
- using MSDS and PPE
- using relevant maintenance documentation and aircraft manuals to:
 - recognise through visual/physical inspection external and internal signs of defects in gas turbine engines, components and system components
 - assist with testing of gas turbine engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
 - compile engine condition monitoring records
 - rig and adjust engine controls and systems
- using fault diagnosis guides and equivalent data, to accurately and efficiently troubleshoot the causes of unserviceabilities in gas turbine engines and engine systems, clearly record details and identify the required rectification actions.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisor or other trades) associated with engine systems. It is essential that system test procedures take into account all safety precautions associated with gas turbine engine system operation, especially with regard to high-energy ignition units, and that awareness be demonstrated of dual inspection requirements associated with work on engine control systems.

This shall be demonstrated through application across the engine systems listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- fault diagnosis techniques
- gas turbine engine layout and operation:
 - types of gas turbine
 - operating principles and power output

- gas path
- intakes
- compressors
- combustion chambers
- turbines
- exhaust
- thrust reversers
- accessory drives
- bearings and seals
- maintenance requirements and troubleshooting procedures
- system and component operation, including electrical and instrument system interfaces:
 - fuel control and fuels
 - lubrication and lubricants
 - air distribution
 - starting
 - ignition
 - power augmentation
 - instrumentation:
 - performance indication
 - condition indication
 - warning
 - presentation and interpretation of electronic displays
 - fire warning and extinguishing
 - control system and rigging of engine controls
- engine spin/run procedures including the operation of auxiliary power units (APUs)
- engine condition monitoring
- relevant WHS practices, including the requirements for the lifting and handling of heavy components
- how to obtain MSDS
- selection and use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in aircraft maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate. The level of troubleshooting is limited in its application to the use of fault diagnosis guides or other similar information.

- The application of testing procedures and functional rigging checks should also indicate knowledge of system operation. Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out rigging checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - engine change unit, main components and accessories/drives
 - control system
 - ignition and starter systems
 - fuel system
 - oil system
 - air system
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA314 Inspect, test and troubleshoot gas turbine engine systems and components, will have fully met the criteria for this unit. The Log of Industrial Experience and Achievement records relating to MEA314 Inspect, test and troubleshoot gas turbine engine systems and components may be accepted as also meeting the evidence requirements for this unit.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA323 Perform advanced troubleshooting in aircraft mechanical maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of system theory knowledge and advanced fault diagnostic skills to identify during the performance of scheduled or unscheduled maintenance the cause of defects in fixed and rotary wing aircraft that are beyond the bounds of maintenance manual fault diagnosis guides. This may be done during individual activities or during supervision of other personnel.

The unit covers competencies required to progress from an Aircraft Maintenance Engineer (AME) at Certificate IV to the granting of a chosen B1 maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide and the Companion Volume CASA Interface.

The skills and knowledge covered by the units of competency listed in the MEA Aeroskills Training Package for Aircraft Maintenance Engineer (Avionics or Mechanical as applicable) at Certificate IV are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Avionics or Mechanical Syllabus subjects/topics listed in the Companion Volume CASA Interface.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|----------------------|--|
| 1. Verify the defect | 1.1 Available information from flight crew, such as flight phase, aircraft configuration, and so on; maintenance |
|----------------------|--|

- documentation both current and previous history; is used as necessary, to assist in fault determination
- 1.2 Inspection of the affected system is carried out to check both physical integrity and correct operation
 - 1.3 Information gained from Central Maintenance Systems is verified against physical integrity and correct operation, where applicable, while observing all relevant work health and safety (WHS) requirements
 - 1.4 The effects on a system from interfaces/integration with other systems are taken into account
2. Isolate the defect
 - 2.1 Logical processes, including the application of basic principles and system knowledge and known facts, are used to augment maintenance manual fault diagnosis guides to ensure efficient and accurate troubleshooting
 - 2.2 Specialist advice is obtained, where required and/or available, to assist with the troubleshooting process
 - 2.3 Faults are located and the causes of the defects are clearly identified and correctly recorded in maintenance documentation, including any other systems disturbed, where required
 3. Determine defect rectification requirements
 - 3.1 Defect rectification requirements are determined and the necessary repair action initiated once verification and isolation of the defect are confirmed
 4. Verify defect rectification
 - 4.1 Defect is rectified in accordance with approved maintenance data
 - 4.2 All systems disturbed or accessed during troubleshooting are restored, as applicable, using maintenance manuals, repair schemes or approved maintenance data while observing relevant WHS procedures
 - 4.3 All checks required by approved maintenance data to ensure correct operation of all disturbed systems are performed

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Troubleshooting

- The competency applies to the troubleshooting, from first principles, of defects beyond available maintenance data in the systems of fixed or rotary wing aircraft types. Troubleshooting must be demonstrated across a range of typical systems and system components that includes but is not limited to airframes, their engines and all systems (and parts thereof) operated by inherently mechanical or hydro-mechanical principles or means. Coverage is not required of specific type systems that are included in type training and practical consolidation of training (PCT) activities leading to a specific type licence rating

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Applicable systems include:

- Hydro-mechanical systems
- Pneumatic systems
- Flight control systems
- Engines and engine systems
- Propeller and rotor systems

Unit Mapping Information

Release 1 – equivalent to MEA323B Perform advanced troubleshooting in aircraft mechanical maintenance

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA323 Perform advanced troubleshooting in aircraft mechanical maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- diagnosing faults that are beyond the coverage of maintenance manual fault diagnosis guides in simulated applications in the training environment and/or in the workplace across a representative range of systems and components.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications related to mechanical systems, and where applicable other system interfaces/integration. It is essential that system test procedures take into account all safety precautions applicable to the system being maintained. Ability to interpret inspection procedures and specifications (allowable limits) and ensure that they are applied in practice is critical, as is the demonstrated ability to apply fundamental system theory in the logical diagnosis of complex faults.

Evidence of transferability of skills and knowledge related to performance and supervision of inspection, testing and troubleshooting is essential. This must be demonstrated through application across a number of the applicable systems listed in the Range of Conditions, including system interfaces/integration.

Knowledge Evidence

For systems and components relevant to the scope of the licence/ratings sought knowledge is required of:

- theory related to system operation and interfaces between systems and with electrical/electronic control media to a level that will facilitate the diagnosis of faults beyond the level of maintenance manual fault diagnosis guides using reported symptoms and functional test results
- component construction and theory of operation to a level that will facilitate the diagnosis of faults beyond the level of maintenance manual fault diagnosis guides using reported symptoms and functional test results
- advanced fault diagnostic techniques
- condition monitoring and trend analysis techniques.

Assessment Conditions

- Competency is assessed in the workplace or simulated workplace and shall involve successfully dealing with a number of maintenance and fault scenarios across a range of systems listed in the Range of Conditions, and related system components.
- The troubleshooting approach should clearly demonstrate an in-depth knowledge of underpinning theory of a system, with this knowledge being used in a logical process to augment and extend the scope of the aircraft/ system fault-finding guide. The fault rectification work plan should take account of applicable safety (including safe handling of heavy components) and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved and the ability to identify the causes of defects not covered fully by maintenance manual fault diagnosis guides has been demonstrated under supervision without intervention. This shall be established via simulated activities at the CASR Part 147 Maintenance Training Organisation and performance during observed workplace activities.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA325 Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of knowledge regarding aircraft weighing and the use of relevant maintenance publications and modification data (where applicable) to weigh a fixed and rotary wing aircraft and use the results to calculate centre of gravity and confirm that it is within limits. Weighing may be performed during scheduled or unscheduled maintenance and involve individual activities and the supervision of other personnel.

The unit covers competencies required to progress from an Aircraft Maintenance Engineer (AME) at Certificate IV to the granting of a chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide and the Companion Volume CASA Interface.

The skills and knowledge covered by the units of competency listed in the MEA Aeroskills Training Package for Aircraft Maintenance Engineer (Avionics or Mechanical as applicable) at Certificate IV are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Syllabus subjects/topics listed in the Companion Volume CASA Interface.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-------------------|---|
| 1. Weigh aircraft | 1.1 The requirement for aircraft weighing is determined |
|-------------------|---|

- 1.1 Aircraft is weighed in accordance with the specified procedure while observing all relevant work health and safety (WHS) requirements
- 1.3 Aircraft weighing results are provided to the Continuing Airworthiness Management Organisation (CAMO)
2. Calculate the weight and balance impact of a modification
 - 2.1 The new empty weight of the aircraft is determined and it is ensured that the weight is within the predetermined limits set by the CAMO
 - 2.2 The new empty weight centre of gravity of the aircraft is calculated and it is ensured that the centre of gravity is within the predetermined limits set by the CAMO
 - 2.3 Maintenance records are updated with new figures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Centre of gravity of the aircraft is calculated:

- Using the results obtained by weighing an aircraft
- Using the weight and moment arm data for a modification

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA325B Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA325 Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- configuring aircraft for weighing
- weighing aircraft
- using weighing results to calculate centre of gravity.

The underlying skills inherent in this unit should be transferable across a range of aircraft types. Ability to interpret the instructions for configuring and weighing aircraft is critical.

Evidence of transferability of skills and knowledge related to weighing of aircraft and calculation of centre of gravity is essential.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- types of weighing equipment used to weigh aircraft and associated safety precautions:
 - mechanical platform scales
 - electronic platform scales
 - electronic load pots
- methods used to level aircraft for weighing
- the importance of correctly configuring aircraft for weighing
- mathematical formulae used to calculate centre of gravity.

Assessment Conditions

- Competency may be assessed in the workplace or in the training environment. The aircraft weighing work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards, especially in relation to aircraft jacking and levelling.

- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision without intervention. This shall be established via simulated activities at the CASR Part 147 Maintenance Training Organisation and performance during observed workplace activities.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA327 Fabricate and/or repair aircraft mechanical components or parts

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of relevant maintenance manuals, drawings and specifications to fabricate and repair a range of fixed and rotary wing aircraft mechanical components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) and Structures Certificate IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Fabricate mechanical components or parts | <ul style="list-style-type: none"> 1.1 Specifications are interpreted to determine the dimensions and procedure for fabrication 1.2 Appropriate materials, tools, equipment and assembly or fabrication jigs are selected and prepared for the particular specification requirements 1.3 Components or parts are fabricated in accordance with required specifications while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) 1.4 Test equipment and rigs are used, where applicable, to confirm serviceability of finished components 1.5 Fabricated components are tagged, sealed and packaged within specified procedures 1.6 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. Repair mechanical components or parts | <ul style="list-style-type: none"> 2.1 Repair or replacement requirements are determined, following disassembly and assessment of component parts for serviceability, in accordance with the relevant maintenance documentation while observing all relevant WHS requirements, including the use of MSDS and items of PPE 2.2 Tagging and repair instructions are accurately specified for parts requiring specialist repair 2.3 Components are modified, as approved, by relevant manufacturers' bulletins or procedures 2.4 Mechanical component parts are assembled within |

specified tolerances and in accordance with the appropriate maintenance documents

- 2.5 Mechanical components are adjusted, as required, to operate within prescribed specifications
- 2.6 Repaired components are tagged, sealed and packaged in accordance with specified procedures
- 2.7 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Applicable components to be fabricated and/or repaired include:

- Hose assemblies
- Pipes
- Cables, pulleys, chains, sprockets and gear drives
- Control rods, bellcranks and links

Repair includes:

- Standard techniques for pipes and replacement of eye-ends, tubes or bearings for control rods/pulleys/sprockets and bushes or bearings for bellcranks and links

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA327B Fabricate and/or repair aircraft mechanical components or parts

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA327 Fabricate and/or repair aircraft mechanical components or parts

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and repair requirements for the range of mechanical components listed in the Range of Conditions
 - fabricate components
 - identify requirements and complete repairs
 - test and/or adjust components, as required
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of fabrication and repair applications associated with aircraft components. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved. This shall be demonstrated through application across a number of different aircraft components listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component operation
- fabrication and repair procedures and processes
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- relevant WHS practices
- how to obtain MSDS
- use of PPE.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general and special-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Evidence of knowledge about the general aspects of material specification and selection, measurement, fabrication and repair should be related to specific aircraft component applications. Ability to assess component serviceability and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one item from each of the following groups:
 - hose assemblies
 - pipes
 - cables, pulleys, chains, sprockets and gear drives
 - control rods, bellcranks and links.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA328 Maintain and/or repair aircraft mechanical components or parts will have fully met the criteria for Element 2. The Log of Industrial Experience and Achievement records relating to MEA328 Maintain and/or repair aircraft mechanical components or parts may be accepted as also meeting the evidence requirements for the Performance Criteria for this Element.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA328 Maintain and/or repair aircraft mechanical components or parts

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of relevant maintenance publications to maintain and repair a range of aircraft mechanical components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include fixed and rotary wing aircraft, and components in workshops.

This unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA302	Remove and install aircraft hydro-mechanical and landing gear system components
MEA303	Remove and install aircraft pneumatic system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Maintain and/or repair mechanical components or parts | 1.1 Maintenance and/or repair requirements are determined, following disassembly and assessment of component parts for serviceability, in accordance with the relevant maintenance documentation |
| | 1.2 Tagging and repair instructions are accurately specified for parts requiring specialist repair |
| | 1.3 Appropriate materials, tools, equipment and assembly or fabrication jigs are selected and prepared for the particular specification requirements |
| | 1.4 Components or parts are maintained, repaired or modified, as approved by relevant manufacturers' bulletins or procedures, in accordance with required specifications while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.5 Mechanical component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents |
| | 1.6 Mechanical components are adjusted, as required, to operate within prescribed specifications |
| | 1.7 Test equipment and rigs are used, where applicable, to confirm serviceability |
| | 1.8 Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures |
| | 1.9 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Components or parts to be maintained and/or repaired include:

- Hoses
- Pipes
- Cables, pulleys, chains, sprockets and gear drives
- Control rods, bellcranks and links
- Non-structural removable components of fuselages, fairings, nacelles, empennage, wings and thrust reversers. for non-pressurised aircraft – entry, cargo, access doors and associated seals, windows and transparent panels
- Trim panels, linings, seats, cabin equipment and consoles, floor panels, coverings and emergency equipment (including passenger escape systems, inflatable slides, life jackets, rafts, location transmitters, beacons, and cargo, crew and/or passenger seat restraints)

Repair includes:

- Standard techniques for pipes and replacement of eye-ends, tubes or bearings for control rods/pulleys/sprockets and bushes or bearings for bellcranks and links

Maintain involves:

- Cleaning, inspection for wear or damage, and adjustment and lubrication, where applicable

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA328C Maintain and/or repair aircraft mechanical components or parts

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA328 Maintain and/or repair aircraft mechanical components or parts

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and repair requirements for the range of mechanical components listed in the Range of Conditions
 - identify requirements and complete repairs and/or modifications
 - test and/or adjust components, as required.
- correctly tag, seal and package completed components

The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with aircraft components. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- construction, repair procedures and processes for:
 - cables
 - pulleys
 - chains
 - sprockets
 - gear drives
 - control rods
 - bellcranks
 - linkages

- non-structural removable components of fuselages, fairings, nacelles, empennage and wings
- engine thrust reversers
- from unpressurised aircraft:
 - entry, cargo and access doors
 - windows
 - transparent panels
- construction and serviceability criteria for hoses and pipes, including pressure test requirements
- construction, materials, cleaning and repair requirements for:
 - trim panels
 - cabin linings
 - seats
 - cabin equipment and consoles
 - floor panels
 - coverings
 - emergency equipment and stowages
 - cargo, crew and/or passenger seat restraints
- relevant WHS practices
- how to obtain MSDS
- use of PPE
- relevant maintenance manuals, standards and specifications
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general and special-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Ability to assess component serviceability and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of components or parts from each of the following groups:
 - hoses
 - pipes
 - cables, pulleys, chains, sprockets and gear drives
 - control rods, bellcranks and links

- non-structural removable components of fuselages, fairings, nacelles, empennage, wings and thrust reversers. for non-pressurised aircraft – entry, cargo, access doors and associated seals, windows and transparent panels
- trim panels, linings, seats, cabin equipment and consoles, floor panels, coverings and emergency equipment (including passenger escape systems, inflatable slides, life jackets, rafts, location transmitters, beacons, and cargo, crew and/or passenger seat restraints).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA327 Fabricate and/or repair aircraft mechanical components or parts will have partially met the performance criteria for Element 1 for some of the listed variables. The Log of Industrial Experience and Achievement records relating to MEA327 Fabricate and/or repair aircraft mechanical components or parts may be accepted as also meeting the evidence requirements for the performance criteria for this Element in respect to common variables.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA329 Maintain aircraft basic hydraulic and pneumatic components or parts

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and use of maintenance documentation to maintain, repair and modify aircraft basic hydraulic and pneumatic components during scheduled or unscheduled maintenance under the guidance of a qualified person. Work under the guidance of a qualified person may be performed individually or as part of a team.

Applications include fixed and rotary wing aircraft components either attached to the aircraft or in a workshop.

The unit is part of a Mechanical Certificate II training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Prepare to dismantle, inspect, maintain and assemble basic hydraulic and pneumatic components or parts | <p>1.1 Components are removed and/or disassembled in accordance with enterprise procedures, relevant maintenance documentation and qualified person guidance</p> <p>1.2 Maintenance and/or repair requirements as defined by the qualified person, enterprise procedures and the relevant maintenance documentation are understood</p> <p>1.3 Tagging and repair instructions are accurately specified in accordance with enterprise procedures and qualified person directions for parts requiring specialist repair</p> <p>1.4 Appropriate materials, tools, equipment and assembly or fabrication jigs, where applicable, are selected and prepared for the particular maintenance and repair requirements in accordance with enterprise procedures and relevant maintenance documentation</p> |
| 2. Dismantle, inspect, maintain and assemble basic hydraulic and pneumatic components or parts | <p>2.1 Routine maintenance, repair or modification procedures are carried out, as approved by relevant manufacturers' bulletins or procedures, in accordance with required enterprise procedures and specifications while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)</p> <p>2.2 Component parts are assembled within specified tolerances and in accordance with enterprise procedures and the appropriate maintenance documents</p> <p>2.3 Where applicable and as required by the qualified person, assistance is provided in the final adjustment and testing of components to confirm serviceability</p> |
| 3. Complete maintenance | <p>3.1 Required documentation is completed and processed in</p> |

and repair activities

accordance with standard enterprise procedures

- 3.2 Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Components to be maintained and/or repaired/modified include:

- Hoses
- Pipes
- Simple check or shutoff valves
- Basic hydraulic and pneumatic actuators and valves

Routine work:

- Is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure)

Work outcomes:

- Are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality

Scope of work:

- Note that the scope of any repair or modification and the procedure to be followed will be provided by the qualified person, and be within the scope of the skills and knowledge included in the unit of competency MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Maintain includes:

- Cleaning, inspection for wear or damage and consequent replacement of parts, and routine adjustment and lubrication, where applicable, in accordance with enterprise procedures

Procedures and requirements include:

- Industry procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA329B Dismantle, inspect, maintain and assemble aircraft basic hydraulic and pneumatic components or parts

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA329 Maintain aircraft basic hydraulic and pneumatic components or parts

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and standard/routine repair requirements for the range of hydraulic and pneumatic components listed in the Range of Conditions
 - identify requirements under the guidance of a qualified person and complete routine repairs and/or modifications
 - adjust components under expert guidance as required
 - where post-assembly testing is applicable, set up components for testing and have a basic understanding of the test procedures
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with aircraft components. It is essential that the relevant enterprise procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component operation at a basic level
- standard/routine repair procedures and processes
- relevant WHS practices
- how to obtain MSDS
- use of PPE.

For the purpose of this unit of competency, basic knowledge is defined as the level of knowledge required to:

- understand the instructions provided by qualified persons and relevant documentation for the disassembly, routine replacement of component parts and seals and reassembly of components
- under guidance and in the training environment, make post-assembly adjustments, such as length of stroke or operating pressure
- under guidance and in the training environment, perform simple tests involving pressure and function.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that applicable general and special-purpose tools found in most routine situations would be used where appropriate.
- Ability to assess component serviceability under qualified person guidance and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under qualified person guidance on a representative range of components or parts from each of:
 - hoses
 - pipes
 - simple check or shutoff valves
 - basic hydraulic and pneumatic actuators and valves.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA330 Maintain aircraft non-primary structural removable components or parts and internal fittings

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and use of maintenance documentation to dismantle, inspect, maintain and assemble aircraft non-primary structural removable components and interior fittings/emergency equipment during scheduled or unscheduled maintenance under the guidance of a qualified person. Work under the guidance of a qualified person may be performed individually or as part of a team.

Applications include fixed and rotary wing aircraft components either attached to the aircraft or in a workshop.

The unit is part of a Mechanical Certificate II training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Prepare to dismantle, inspect, maintain and assemble non-primary structural removable components or parts and internal fittings | 1.1 Components are removed and/or disassembled in accordance with enterprise procedures, relevant maintenance documentation and qualified person guidance while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.2 Maintenance and/or repair requirements as defined by the qualified person, enterprise procedures and the relevant maintenance documentation are understood |
| | 1.3 Tagging and repair instructions are accurately specified in accordance with enterprise procedures and qualified person directions for parts requiring specialist repair |
| | 1.4 Appropriate materials, tools, equipment and assembly or fabrication jigs, where applicable, are selected and prepared for the particular maintenance and repair requirements in accordance with enterprise procedures and relevant maintenance documentation |
| 2. Dismantle, inspect, maintain and assemble non-primary structural removable components or parts and internal fittings | 2.1 Routine maintenance, repair or modification processes are carried out as approved by relevant manufacturers' bulletins or procedures, in accordance with required enterprise procedures and specifications while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 2.2 Component parts are assembled within specified tolerances in accordance with enterprise procedures and the appropriate maintenance documents |
| | 2.3 Where applicable and as required by the qualified person, assistance is provided in the conduct of final load or functional tests |

- | | |
|--|--|
| 3. Complete maintenance/ modification activities | 3.1 Required documentation is completed and processed in accordance with standard enterprise procedures |
| | 3.2 Where applicable, maintained/repaired or modified components are tagged, sealed and packaged within specified procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Routine maintenance, repair or modification processes are performed on:

- Non-structural removable components of fuselages, fairings, nacelles, empennage, wings and thrust reversers. For non-pressurised aircraft – entry, cargo, access doors and associated seals, windows and transparent panels
- Trim panels, linings, seats, cabin equipment and consoles, floor panels, coverings, emergency equipment, including passenger escape systems and inflatable slides, where appropriate (excluding removal and installation of slides fitted to wide-bodied aircraft), and cargo, crew and/or passenger seat restraints
- Stowages for life jackets, rafts, location transmitters and beacons, including the removal and installation of the equipment, where applicable

Routine work:

- Is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure)

Work outcomes:

- Are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality

Primary structure:

- Note that 'primary structure/structural' refers to all components of an aircraft, the failure of which would

- seriously endanger safety, e.g. wing or tailplane spars, main fuselage frames, engine bearers, portions of skin that are highly stressed. 'Non-primary' refers to any other items
- The scope of any modification and the procedure to be followed:**
- The scope of any modification and the procedure to be followed will be provided by the qualified person, and be within the scope of the skills and knowledge included in the unit of competency MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
- Repair includes:**
- Standard techniques as defined by the qualified person and/or the relevant maintenance manual
- Maintain includes:**
- Removal and installation, cleaning, inspection for wear or damage and consequent replacement of parts, and routine adjustment and lubrication, where applicable, in accordance with enterprise procedures
- Procedures and requirements include:**
- Industry procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA330B Dismantle, inspect, maintain and assemble aircraft non-primary structural removable components or parts and internal fittings

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA330 Maintain aircraft non-primary structural removable components or parts and internal fittings

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - for on-aircraft work, correctly remove and install components covered by the Range of Conditions, including emergency equipment
 - recognise state of serviceability and standard/routine repair requirements for the range of components listed in the Range of Conditions
 - identify requirements under the guidance of a supervisor and complete repairs and/or modifications
 - adjust components under expert guidance, as required
 - where load or functional testing is applicable, in the training environment, set up components for testing and perform tests
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with the aircraft components listed in the Range of Conditions. It is essential that the relevant enterprise procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component construction and/or operation at a basic level
- standard/routine repair procedures and processes
- relevant WHS practices
- how to obtain MSDS

- use of PPE.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that applicable general and special-purpose tools found in most routine situations would be used where appropriate, and that competency would be demonstrated in setting up components for functional or load testing where such routine tests are specified.
- Ability to assess component serviceability and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under qualified person guidance on a representative range of components or parts from each of:
 - non-structural removable components of fuselages, fairings, nacelles, empennage, wings and thrust reversers. For non-pressurised aircraft – entry, cargo, access doors and associated seals, windows and transparent panels
 - trim panels, linings, seats, cabin equipment and consoles, floor panels, coverings, emergency equipment, including passenger escape systems and inflatable slides where appropriate (excluding removal and installation of slides fitted to wide-bodied aircraft), and cargo, crew and/or passenger seat restraints
 - stowages for life jackets, rafts, location transmitters and beacons (including the removal and installation of the equipment where applicable).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA331 Maintain aircraft gas turbine engine components or parts

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and use of maintenance documentation to dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts during scheduled or unscheduled maintenance under the guidance of a qualified person. Work under the guidance of a qualified person may be performed individually or as part of a team.

Applications include gas turbine engine components or parts in a workshop.

The unit is part of a Mechanical Certificate II training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Prepare to dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts | <p>1.1 Components are removed and/or disassembled in accordance with enterprise procedures, relevant maintenance documentation and qualified person guidance while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)</p> <p>1.2 Maintenance and/or repair requirements as defined by the qualified person, enterprise procedures and the relevant maintenance documentation are understood</p> <p>1.3 Tagging and repair instructions are accurately specified in accordance with enterprise procedures and qualified person directions for parts requiring specialist repair</p> <p>1.4 Appropriate materials, tools, equipment and assembly or fabrication jigs, where applicable, are selected and prepared for the particular maintenance and repair requirements in accordance with enterprise procedures and relevant maintenance documentation</p> |
| 2. Dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts | <p>2.1 Routine maintenance, repair or modification procedures are carried out, as approved by relevant manufacturers' bulletins or procedures, in accordance with required enterprise procedures and specifications while observing all relevant WHS requirements, including the use of MSDS and items of PPE</p> <p>2.2 Component parts are assembled within specified tolerances and in accordance with enterprise procedures and the appropriate maintenance documents</p> <p>2.3 Where applicable and as required by the qualified person, assistance is provided in the final adjustment and testing of components to confirm serviceability</p> |
| 3. Complete maintenance repair or modification | <p>3.1 Required documentation is completed and processed in accordance with standard enterprise procedures</p> |

activities

- 3.2 Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Routine work:**
 - Is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure).
- Work outcomes:**
 - Are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality.
- Components to be maintained include:**
 - Basic components, such as oil coolers, fuel nozzles, flex drive shafts, fuel manifolds and engine bearings, engine change unit hoses, pipes and ducts, and like components fitted to modular assemblies and sub-assemblies
- Components to be repaired or modified include:**
 - Compressor and turbine blades
- Scope of work:**
 - Note that the scope of any repair or modification and the procedure to be followed will be provided by the qualified person, and be within the scope of the skills and knowledge included in the unit of competency MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
- Maintain includes:**
 - Removal and installation, cleaning, inspection for wear or damage and consequent replacement of parts, and routine adjustment and lubrication, where applicable, in accordance with enterprise procedures
- Procedures and**
 - Industry procedures specified by manufacturers, regulatory authorities or the enterprise

requirements include:

Unit Mapping Information

Release 1 – equivalent to MEA331B Dismantle, inspect, maintain and assemble aircraft gas turbine engine components or parts

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA331 Maintain aircraft gas turbine engine components or parts

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and standard/routine maintenance and repair requirements for the range of engine components listed in the Range of Conditions
 - identify requirements under the guidance of a qualified person and complete repairs and/or modifications
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with engine components. It is essential that the relevant enterprise procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component operation at a basic level
- standard/routine repair procedures and processes
- relevant WHS practices
- how to obtain MSDS
- use of PPE.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that applicable general and special-purpose tools found in most routine situations would be used where appropriate.
- Ability to assess component serviceability under qualified person guidance and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under qualified person guidance on a representative range of components or parts, as follows:
 - maintain basic components such as oil coolers, fuel nozzles, flex drive shafts, fuel manifolds and engine bearings, engine change unit hoses, pipes and ducts, and like components fitted to modular assemblies and sub-assemblies
 - repair or modify compressor and turbine blades.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A332 Maintain aircraft mechanical components or parts

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and use of maintenance documentation to dismantle, inspect, maintain and assemble aircraft mechanical components or parts during scheduled or unscheduled maintenance under the guidance of a qualified person. Work under the guidance of a qualified person may be performed individually or as part of a team.

Applications include components or parts either attached to the aircraft or in a workshop. It does not include work on hydraulic and pneumatic components or parts.

The unit is part of a Mechanical Certificate II training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Prepare to dismantle, inspect, maintain and assemble basic mechanical components or parts | 1.1 | Components are removed and/or disassembled in accordance with enterprise procedures, relevant maintenance documentation and qualified person guidance while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.2 | Maintenance and/or repair requirements as defined by the qualified person, enterprise procedures and the relevant maintenance documentation are understood |
| | | 1.3 | Tagging and repair instructions are accurately specified in accordance with enterprise procedures and qualified person directions for parts requiring specialist repair |
| | | 1.4 | Appropriate materials, tools, equipment and assembly or fabrication jigs, where applicable, are selected and prepared for the particular maintenance and repair requirements in accordance with enterprise procedures and relevant maintenance documentation |
| 2. | Maintain and/or repair mechanical components or parts | 2.1 | Routine maintenance, repair or modification procedures are carried out, as approved by relevant manufacturers' bulletins or procedures, in accordance with required enterprise procedures and specifications while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 2.2 | Mechanical component parts are assembled within specified tolerances in accordance with enterprise procedures and the appropriate maintenance documents |
| | | 2.3 | Where applicable and as required by the qualified person, assistance is provided in the final adjustment of components to confirm serviceability |
| 3. | Complete maintenance/ | 3.1 | Required documentation is completed and processed |

repair activities in accordance with standard enterprise procedures

- 3.2 Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Routine work:**
- Is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure)
- Outcomes:**
- Are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality
- Basic components to be maintained and/or repaired/modified include:**
- Pulleys
 - Chains
 - Sprockets
 - Gear drives
 - Control rods
 - Bellcranks and links
- Scope of work:**
- Note that the scope of any repair or modification and the procedure to be followed will be provided by the qualified person, and be within the scope of the skills and knowledge included in the unit of competency MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
- Repair includes:**
- Replacement of parts such as eye-ends, tubes, bearings and bushes
- Maintain includes:**
- Cleaning, inspection for wear or damage and routine adjustment and lubrication where applicable in accordance with enterprise procedures

Procedures and requirements include:

- Industry procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA332B Dismantle, inspect, maintain and assemble aircraft mechanical components or parts

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA332 Maintain aircraft mechanical components or parts

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and standard/routine repair requirements for the range of mechanical components listed in the Range of Conditions
 - identify requirements under the guidance of a qualified person and complete routine repairs and/or modifications
 - adjust components under qualified person guidance as required
 - where post-assembly testing is applicable, under guidance and in the training environment, set up components for testing and perform tests
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with aircraft components. It is essential that the relevant enterprise procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component operation at a basic level
- standard/routine repair procedures and processes
- relevant WHS practices
- how to obtain MSDS
- use of PPE.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special-purpose tools found in most routine situations would be used where appropriate.
- Ability to assess component serviceability under qualified person guidance and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under qualified person guidance on a representative range of basic components, including:
 - cables
 - pulleys
 - chains
 - sprockets
 - gear drives
 - control rods
 - bellcranks and links.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA333 Maintain aircraft piston engine components or parts

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and use of maintenance documentation to dismantle, inspect, maintain and assemble aircraft piston engine components or parts during scheduled or unscheduled maintenance under the guidance of a qualified person. Work under the guidance of a qualified person may be performed individually or as part of a team.

Applications include piston engine components or parts in a workshop.

The unit is part of a Mechanical Certificate II training pathway. Achievement of this unit will contribute towards the attainment of units MEA392 Disassemble aircraft piston engines, MEA393 Repair and/or overhaul aircraft piston engine cylinder assembly components, MEA394 Repair and/or overhaul aircraft piston engine crankcase assembly components and MEA395 Reassemble aircraft piston engines.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|---|
| 1. | Prepare to dismantle inspect, maintain and assemble piston engine components or parts | 1.1 | Maintenance and/or repair requirements as defined by the qualified person, standard enterprise procedures and the relevant maintenance documentation are understood |
| | | 1.2 | Tagging and repair instructions are accurately specified in accordance with standard enterprise procedures and as directed by a qualified person for parts requiring specialist repair |
| | | 1.3 | Appropriate materials, tools, equipment and assembly or fabrication jigs, where applicable, are selected and prepared for the particular maintenance and repair requirements in accordance with standard enterprise procedures and relevant maintenance documentation |
| 2. | Dismantle, inspect, maintain and assemble aircraft piston engine components or parts | 2.1 | Components are removed and/or disassembled in accordance with standard enterprise procedures, relevant maintenance documentation and qualified person guidance while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 2.2 | Routine maintenance, repair or modification procedures are carried out, as approved by relevant manufacturers' bulletins or procedures, in accordance with required standard enterprise procedures and specifications while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 2.3 | Component parts are assembled within specified tolerances and in accordance with standard enterprise procedures and the appropriate maintenance documents |
| | | 2.4 | Where applicable, and as required by the qualified person, assistance is provided in the final adjustment |

and testing of components to confirm serviceability

- | | | | |
|----|---|-----|--|
| 3. | Complete maintenance, repair or modification activities | 3.1 | Required documentation is completed and processed in accordance with standard enterprise procedures |
| | | 3.2 | Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Routine work:

- Is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course or procedure)

Work outcomes

- Are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with standard enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality

Scope of work:

- Note that the scope of any repair or modification and the procedure to be followed will be provided by the qualified person, and will be within the scope of the unit of competency MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Maintain includes:

- Removal and installation, cleaning, inspection for wear or damage and consequent replacement of parts, and routine adjustment and lubrication where applicable, in accordance with standard enterprise procedures

Components to be maintained include:

- Hoses, pipes, ducts and components of:
 - cooling systems
 - engine cylinder assemblies

- engine crankcase assemblies
 - accessory drives
 - lubrication systems
- Procedures and requirements include:**
- Industry procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA333B Dismantle, inspect, maintain and assemble aircraft piston engine components or parts

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA333 Maintain aircraft piston engine components or parts

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and standard/routine maintenance and repair requirements for the range of engine components listed in the Range of Conditions
 - identify requirements under the guidance of a qualified person and complete repairs and/or modifications
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with engine components. It is essential that the relevant standard enterprise procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component operation at a basic level
- standard/routine repair procedures and processes
- relevant WHS practices
- how to obtain MSDS
- use of PPE.

For the purpose of this unit, basic knowledge is defined as the level of knowledge required to:

- remove, install and maintain components such as hoses, pipes and ducts etc
- dismantle and maintain engine assemblies and sub-assemblies

- apply unit MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance, skills to repair or modify components of sub-assemblies and systems listed in the Range of Conditions.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that applicable general and special-purpose tools found in most routine situations would be used where appropriate.
- Ability to assess component serviceability under qualified person guidance and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under qualified person guidance on a representative range of components or parts, as follows:
 - cooling systems
 - engine cylinder assemblies
 - engine crankcase assemblies
 - accessory drives
 - lubrication systems.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA339 Inspect, repair and maintain aircraft structures

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of procedures and techniques associated with the inspection and maintenance of aircraft structures, and with the performance of a limited range of metal and composite repairs during scheduled or unscheduled maintenance, including special inspections required after events, such as heavy landings, overstress or flight through heavy turbulence. Applications include the individual or team-related performance of structural maintenance activities on fixed or rotary wing aircraft on the flight line or in the hangar.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA304 Remove and install non-pressurised aircraft structural and non-structural components

OR

MEA317 Remove and install pressurised aircraft structural and non-structural components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|---|
| 1. | Inspect aircraft structure | 1.1 | Relevant maintenance documentation is used to identify specific inspection requirements |
| | | 1.2 | Appropriate preparation and access to the aircraft structure is undertaken to allow for proper inspection in accordance with maintenance documentation |
| | | 1.3 | Aircraft structure is visually or physically checked for signs of deformation defects or damage in accordance with maintenance documentation and approved procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.4 | Damage or defects are assessed against damage or wear limits specified by structural repair manual or other approved data to determine if repair or replacement is required |
| | | 1.5 | Maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. | Prepare to undertake repair | 2.1 | Extent of damage is correctly assessed to assist in determining repair procedure |
| | | 2.2 | Appropriate repair scheme is identified in accordance with structural repair manual and/or approved data |
| | | 2.3 | Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage is out of limits |
| | | 2.4 | All materials and equipment required are organised |
| 3. | Repair and maintain aircraft structure | 3.1 | Structural repairs are performed in accordance with approved repair scheme ensuring that aircraft standard practices are used and process requirements are carried out while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 3.2 | Preventative maintenance techniques are employed to |

preserve the integrity of aircraft structure

- 3.3 Work area is cleaned of all waste material or contaminants
- 3.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Inspection of aircraft structure includes:

- Non-ferrous and ferrous alloys and composite (FRP) materials used in aircraft construction
- Structural fastening and attachment hardware and/or devices
- Seals and sealants
- Glass and moulded plastics
- Application of non-destructive testing (NDT) techniques
- Doors, hinges and locking mechanisms for damage/misalignment
- Inspections applicable to each of safe life, damage tolerant and fail safe structure relevant to enterprise
- Ageing aircraft inspection programs

Damage or defects include:

- Impact damage
- Fatigue cracking
- Corrosion
- Delamination of composites and bonded structures

Structural repairs include:

- Remove corrosion by chemical and mechanical methods
- Restore protective coatings
- Apply sealants and jointing compounds
- Freehand precision hole generation
- Remove and install structural hardware and fastening devices

- Remove and replace bushes, bearings and bearing surfaces
 - Metal scab patch, flush, splice, lap and formed section repair
 - Composite external patch, scarf, stepped and bolted repairs
- Specialist advice is obtained from:**
- Supervisors
 - Specialist structures personnel
- Relevant maintenance documentation includes:**
- Servicing schedules
 - Maintenance manuals
 - Applicable Defence regulations and instructions
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA339C Inspect, repair and maintain aircraft structures

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA339 Inspect, repair and maintain aircraft structures

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all relevant WHS procedures, including the use of MSDS and selection and use of applicable items of PPE
- demonstrating appropriate cleaning procedures to enable structure inspection
- demonstrating correct inspection procedures, in particular pressurised aircraft, in accordance with aircraft and procedures manuals
- identifying damage to aircraft metallic (ferrous and non-ferrous) structures and/or components by way of impact, fatigue or the various types of corrosion
- inspecting damage and assessing composite components/structures
- identifying various aircraft metals and their basic properties
- identifying composite materials used in aircraft construction, associated safety precautions and hazards
- correctly interpreting repair scheme drawings, including third angle projection, isometric, sectional formats and hand sketches
- using appropriate hand tools and machines, including riveting equipment, drilling equipment, aligning tools and material fasteners (grip pins)
- applying correct removal, installation and repair techniques for:
 - a range of rivets (blind and solid) using hand, squeeze and pneumatic situations
 - a range of close tolerance fasteners (standard and oversize – hillocks and taper locks), including hole preparation
 - threaded devices, including internal and external thread cutting, Helicoil inserts and damaged stud replacement
 - hardware assembled by close tolerance fits using heat, cooling and force methods, including bearings, bushes and inserts
- performing a range of metal structure and composite material repair techniques, including:
 - metal scab patch, flush, splice, lap and formed section repair
 - composite external patch, scarf and stepped repairs
 - bolted repairs to composite skin
 - metal to metal and metal to composite bonding
- applying structural corrosion removal/treatment techniques
- restoring aircraft structure sealing and surface finishes.

It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure.

Evidence of transferability of skills and knowledge related to inspection, testing and repair of aircraft structure is essential. This shall be demonstrated through application across a number of different aircraft components as listed in the Assessment Conditions.

Ability to interpret inspection and repair procedures and specifications and apply them in practice is critical. The application of the procedures should also clearly indicate knowledge of structural flight loads and aerodynamic requirements.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- applicable WHS procedures, including the use of MSDS and PPE
- construction methods and materials used in:
 - fuselage sections
 - wing sections
 - engine nacelles and mounts
 - windows and window frames
 - doors, locks and access panels in pressurised and non-pressurised aircraft
- definition of structural terms, i.e. safe life, damage tolerant, failsafe, stress, strain, shear and cycles
- inspection requirements for metal and composite structure, including:
 - ageing aircraft inspection requirements
 - safe life structure
 - damage tolerant structure
 - fail safe structure
- potential causes of structural failure
- NDT methods and application of the various techniques
- construction methods of, and assessing common defects in, aircraft plastic transparencies
- basic constructional features of, and assessing common defects in, glass windscreens
- the various forms of structural corrosion, stating the causes and structural effects of corrosion on aircraft
- the terms associated with composite materials
- requirements for handling and storing aircraft metals and composite materials, including sealing agents, to industry standards
- means of identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour
- assessment of structural damage:
 - types and classes of mechanical damage
 - types of corrosion and determining the extent of damage

- relevant documentation and manuals
- damage limits and repair schemes for metallic and non-metallic structure
- procedures for the fabrication and fitment of metal repairs:
 - scab patch
 - flush patch
 - splice
 - lap
 - formed section
- corrosion removal and passivation
- procedures for performing composite repairs:
 - external patch
 - scarf patch
 - stepped repairs
 - bolted repairs
- repair of integral fuel tanks and sealing of faying surfaces, including specific WHS and PPE requirements
- surface finishes and methods of restoration, including specific WHS and PPE requirements
- how to obtain MSDS
- relevant maintenance and structural repair manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision across the variables in the Range of Conditions as follows:
 - inspection and/or testing of at least one (1) item from each of:
 - non-ferrous and ferrous alloys and composite (FRP) materials used in aircraft construction
 - structural fastening and attachment hardware and/or devices
 - seals and sealants
 - glass and moulded plastics
 - application of NDT techniques
 - doors, hinges and locking mechanisms for damage/misalignment

- inspections applicable to each of safe life, damage tolerant and fail safe structure relevant to enterprise
- ageing aircraft inspection programs
- recognition of each type of damage:
 - impact damage
 - fatigue cracking
 - corrosion
- delamination of composites and bonded structures
- one (1) repair task from each of the following groups:
 - remove corrosion by chemical and mechanical methods
 - restore protective coatings
 - apply sealants and jointing compounds
 - freehand precision hole generation
 - remove and install structural hardware and fastening devices
 - remove and replace bushes, bearings and bearing surfaces
 - metal scab patch, flush, splice, lap and formed section repair
 - composite external patch, scarf and stepped repairs.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where applicable, an equivalent industry evidence guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- Individuals being assessed who have already attained MEA369 Inspect and maintain structures and related components of non-pressurised small aircraft, MEA370 Repair the structure of non-pressurised small aircraft and MEA371 Perform major repairs and modifications to small aircraft metal structure will have met the requirements of the Performance Criteria and Range of Conditions variables for Elements 1 to 3 for common variables.
- Those who have attained MEA410 Maintain aircraft structure/components will have met the Performance Criteria and Range of Conditions variables requirements for Element 1.
- The Log of Industrial Experience and Achievement records relating to the units listed above may be accepted as also meeting the evidence requirements for this unit in the applicable areas.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA340 Lay out and set up aircraft systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of basic knowledge of aircraft system design and schematic layout, including the relative advantages of the different types of system.

The unit is part of Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Select and lay out schematically aircraft mechanical systems	1.1 Mechanical system applications in aircraft design and their relative advantages and disadvantages compared to other system types are identified
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- 1.2 Components of mechanical systems are identified
- 1.3 A mechanical system is selected for an application, the schematic layout is sketched and all components are labelled
- 1.4 Mechanical system maintenance requirements are identified
2. Select and lay out schematically aircraft hydraulic systems
 - 2.1 Hydraulic system applications in aircraft design, their operation and their relative advantages and disadvantages compared to other system types are identified
 - 2.2 Aircraft hydraulic fluids, their characteristics and handling precautions are identified
 - 2.3 Components of hydraulic systems are identified and their operation is described in general terms
 - 2.4 A hydraulic system is selected for an application, the schematic layout is sketched and all components are labelled
 - 2.5 Hydraulic system maintenance requirements are identified
3. Select and lay out schematically aircraft pneumatic systems
 - 3.1 Pneumatic system applications in aircraft design, their operation and their relative advantages and disadvantages compared to other system types are identified
 - 3.2 Components of pneumatic systems are identified and their operation is described in general terms
 - 3.3 A pneumatic system is selected for an application, the schematic layout is sketched and all components are labelled
 - 3.4 Pneumatic system maintenance requirements are identified
4. Select and lay out schematically aircraft fuel storage and distribution systems
 - 4.1 Typical fuel storage and distribution systems used in aircraft design are identified
 - 4.2 Components of fuel storage and distribution systems are identified and their operation is described
 - 4.3 A fuel storage and distribution system is selected for an application, the schematic layout is sketched and all

		components are labelled
	4.4	Types of aircraft fuel, their characteristics and handling precautions are identified
	4.5	Fuel storage and distribution system maintenance requirements are identified
5.	Set up and operate a simple hydraulic system	5.1 The hydraulic system is sketched and all components are labelled
		5.2 Required components are obtained
		5.3 The system is assembled and operated while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Mechanical system applications include:

- Flight controls
- Flap operation
- Nose wheel steering
- Landing gear door operation
- Entrance door mechanisms

Components of mechanical systems include:

- Cables
- Chains
- Sprockets
- Pulleys
- Fairleads
- Cable tensioners
- Gearboxes

Hydraulic system applications include:

- Screwjacks
- Rods
- Universal joints
- Constant velocity joints
- Clutches
- Bearings and bushes
- Flight controls
- Flap and spoiler operation
- Landing gear retraction and extension
- Brakes (including anti-skid)
- Nose wheel steering
- Shimmy damping
- Door operation

Components of hydraulic systems include:

- Pumps
- Plumbing
- Valves (manual and electrically operated)
- Actuators
- Motors
- Check valves
- Pressure gauges (direct reading and electrical)
- Electrical control circuit micro switches
- Reservoirs
- Accumulators
- Filters

Pneumatic system applications include:

- Landing gear retraction and extension
- Pneumatic emergency systems for landing gear extension and brakes
- Engine bleed air
- Engine starting
- Anti-icing
- De-icing
- Pressurisation
- Air cycle air conditioning

Components of pneumatic systems include:

- Precoolers
- Pressure regulator and shutoff valves
- Temperature modulating valve
- Check valves
- Over-pressure valves
- Temperature regulating valves
- Underloading valves
- Shuttle valves
- Back pressure valves

Components of fuel storage and distribution systems include:

- Outflow valves
- Heat exchangers
- Moisture separators
- Chemical driers
- Filters
- Mechanical compressors
- Compressed air bottles
- De-icing boots
- Ducting
- Integral fuel cells
- Rigid and flexible fuel cells
- External fuel tanks
- Rigid and flexible plumbing and couplings
- Manifolds
- Selector valves
- Anti-surge valves
- Anti-gravity valves
- Fuel quantity indication
- Fuel flow indication
- Boost pumps
- Transfer pumps
- Filters
- Strainers
- Fuel heaters

Unit Mapping Information

Release 1 – equivalent to MEA340A Lay out and set up aircraft systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA340 Lay out and set up aircraft systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- laying out a typical aircraft mechanical system
- laying out a typical aircraft hydraulic system
- laying out a typical aircraft pneumatic system
- laying out a typical fuel storage and distribution system
- setting up and operating a basic hydraulic system that includes:
 - hydraulic rig
 - manual selector valve
 - filter
 - accumulator
 - check valve
 - linear actuators
 - rigid and flexible plumbing
- applying relevant WHS precautions, including the use of PPE and MSDS.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- fluid power principles
- plumbing identification marking
- mechanical, hydraulic and pneumatic aircraft systems, their components and maintenance requirements
- the relative advantages and disadvantages of mechanical, hydraulic and pneumatic systems
- hydraulic fluid types, characteristics and handling precautions
- aircraft fuel storage and distribution systems and components thereof
- aircraft fuels, their characteristics and handling precautions
- WHS precautions relating to aircraft systems and their operation.

Assessment Conditions

- This unit may be assessed off the job in a training environment equipped to provide exposure to the range of system types and provide for the layout, set-up and operation of basic hydraulic systems. The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- 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, teacher'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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA341 Apply basic aircraft design characteristics

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of basic knowledge of aerodynamic shape and structural methods for aeroplanes and rotary wing aircraft.

The unit is part of Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Research and evaluate aeroplane aerodynamic shape	1.1	Common wing plan forms are identified and relative advantages and disadvantages are evaluated
	1.2	Common wing configurations are identified and

- relative advantages and disadvantages are identified
- 1.3 Aerofoil characteristics are discussed in terms of aircraft performance
 - 1.4 Aeroplane stability and control is discussed in terms of aerodynamic design
 - 1.5 Types of primary and secondary flight control surfaces are identified and control balancing is discussed
 - 1.6 Types of lift augmentation device are identified and compared
 - 1.7 Factors that affect an aircraft in subsonic and high speed flight are identified
2. Research and evaluate rotary wing aerodynamic design
 - 2.1 Common rotor configurations are identified and discuss their aerodynamic characteristics discussed
 - 2.2 Rotary wing aircraft control and stability are discussed
3. Research and evaluate basic aircraft structural design
 - 3.1 The loads acting on an aircraft structure are identified
 - 3.2 The methods of construction of airframes and power plant support structures are identified and compared
 - 3.3 The materials of construction commonly used in aircraft structures are identified and their relative advantages and disadvantages discussed
 - 3.4 Fabrication methods commonly used in aircraft structure are identified and discussed
 - 3.5 Maintenance requirements for aircraft structure are identified
4. Research and evaluate basic landing gear design and construction
 - 4.1 The configurations of landing gear are identified and discussed in terms of relative advantages and disadvantages
 - 4.2 The relative benefits of fixed and retractable landing gear are identified and discussed
 - 4.3 Construction materials used in landing gear components are identified and discussed

5. Apply basic aircraft design characteristics
- 5.1 Given required aircraft use and performance characteristics an appropriate aerodynamic shape is determined
 - 5.2 An appropriate method of construction, materials of construction and fabrication method are proposed
 - 5.3 An appropriate landing gear configuration is proposed

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Common wing plan forms include:

- Straight
- Tapered
- Swept
- Delta
- Variable geometry
- Canard

Common wing configurations include:

- Mid-wing
- Low wing
- High wing

Common rotor configurations include:

- Main rotor and tail rotor
- Two main rotors
- Two blade main rotor
- Multiple blade main rotor
- Hinged main rotor blades
- Rigid rotor

Configurations of landing gear include:

- Tricycle
- Tail wheel
- Tail skid
- Floats
- Skis

- Helicopter skids
- Helicopter wheels and brakes

Unit Mapping Information

Release 1 – equivalent to MEA341A Apply basic aircraft design characteristics

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA341 Apply basic aircraft design characteristics

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying the effects of aerodynamic shape and types of flight controls on aircraft performance, stability and control
- identifying the influence of rotor design on rotary wing aircraft stability and control
- identifying the loads acting on aircraft structure, types of structure and related maintenance requirements
- identifying the types and designs of landing gear and their applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- theory of flight, including rotary wing
- loads acting on aircraft structures and structural fatigue, including rotary wing
- aircraft design characteristics, including rotary wing
- types of aircraft structure
- methods of aircraft construction
- materials of construction
- structural maintenance requirements
- use of non-destructive testing (NDT) in structural maintenance
- basic landing gear design characteristics
- use of ultra-high strength steels in landing gear design and related maintenance requirements.

Assessment Conditions

- This unit may be assessed off the job in a training environment equipped to provide exposure to the relevant aircraft design characteristics and to theory of flight.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.

- 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.
- 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, teacher'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.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A342 Apply basic aircraft power plant design characteristics

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of basic knowledge of propulsion and power plant selection for aeroplanes and rotary wing aircraft, piston engines and propellers/rotors, turbo prop, gas turbines and gas turbine/rotor.

The unit is part of Diploma and Advanced Diploma training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.	Research and evaluate the types of aeroplane and rotary wing	1.1	The types of aeroplane and rotary wing aircraft power plant are identified and compared in terms of relative advantages and disadvantages
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aircraft power plant and their relative advantages and disadvantages	1.2	Types of propeller are identified and compared in terms of relative advantages and disadvantages
	1.3	Turbojet and turbofan performance is compared in terms of relative advantages and disadvantages
	1.4	Maintenance requirements for aircraft power plants are identified
2. Apply basic power plant and propulsion system selection processes	2.1	Given required aeroplane use and performance characteristics an appropriate type of power plant is determined
	2.2	An appropriate type of propulsion system is selected
	2.3	Given required rotary wing aircraft use and performance characteristics an appropriate type of power plant is determined

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Types of aeroplane and rotary wing aircraft power plant include:

- Piston engine (petrol or diesel)
- Rotary
- Turboprop or gas turbine and rotor
- Turbofan
- Turbojet

Types of propellers include:

- Fixed pitch
- Adjustable pitch
- Constant speed
- Contra-rotating
- Tractor
- Pusher

Unit Mapping Information

Release 1 – equivalent to MEA342A Apply basic aircraft power plant design characteristics

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA342 Apply basic aircraft power plant design characteristics

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying the different types of aircraft power plant and their relative advantages and applications
- identifying power plant maintenance and monitoring requirements
- identifying different types of propellers and their applications
- selecting power plants for aeroplanes and rotary wing aircraft given the applicable performance characteristics.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- basic power plant characteristics
- basic propeller theory and characteristics
- use of non-destructive testing (NDT) in power plant maintenance
- power plant maintenance requirements including the use of engine condition monitoring.

Assessment Conditions

- This unit may be assessed off the job in a training environment equipped to provide exposure to the relevant aircraft design characteristics and to theory of flight.
- The candidate must have access to all tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials. The assessment environment should not disadvantage the candidate.
- 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.
- 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, teacher'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.

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A343 Remove and install avionic system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the removal, installation and task certification of avionic system components of fixed and rotary wing aircraft during the performance of scheduled or unscheduled maintenance where system serviceability can be established by a simple self-test facility, other on-board test systems/equipment or by simple ramp test equipment. Maintenance may be performed individually or as part of a team.

The unit is part of the B1 maintenance certification licensing pathway under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

ME A227 Test and troubleshoot aircraft electrical systems and components

OR

ME A211 Inspect, test and troubleshoot advanced aircraft electrical systems and components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-------------------------------------|--|
| 1. Remove avionic system components | 1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags |
|-------------------------------------|--|

- are fitted, where necessary, to ensure personnel safety
- 1.2 Avionic component removal is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements
 - 1.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 1.4 Removed components are tagged and packaged in accordance with specified procedures
2. Install avionic system components and verify system serviceability
 - 2.1 Avionic components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
 - 2.2 Installation of avionic components is performed in accordance with the applicable maintenance manual and regulatory requirements while observing all relevant WHS requirements
 - 2.3 System is reinstated to correct operational condition and is tested for serviceability
 - 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures and regulatory requirements

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

Avionic components

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise.
- Components/line replaceable units (LRUs) from

include:

electronic instrument systems

- Components/LRUs from engine indication systems
- Communication system components
- Navigation system components
- Software updates to avionic systems where serviceability can be determined by a simple test

Tested for serviceability includes:

- Confirming system serviceability through the operation of built-in test equipment or any other on-board system that can confirm correct operation
- Using only off-aircraft test equipment that provides a simple go/no go decision regarding system serviceability

Unit Mapping Information

Release 1 – equivalent to MEA343B Remove and install avionic system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA343 Remove and install avionic system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- locating and identifying avionic components that are part of instrument and radio systems
- determining that component and system serviceability can be confirmed by a simple self-test facility, other on-board test systems/equipment or by simple ramp test equipment requiring a simple go/no go decision
- applying relevant WHS practices
- applying component attachment methods
- connecting hardware and plugs
- handling precautions for electrostatic sensitive devices
- using approved maintenance documentation and aircraft publications relating to avionic systems
- using built-in test equipment to confirm system serviceability (this may involve the operation of specific built-in test equipment, on-board maintenance systems and Integrated Modular Avionic modules).

It is essential that cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with, as well as work practices associated with electrostatic sensitive devices.

Evidence of transferability of skills and knowledge related to removal and installation is essential. This is to be demonstrated by application across a range of aircraft avionic system components as listed in the Assessment Conditions.

Knowledge Evidence

- Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:
 - electronic fundamentals
 - digital techniques relating to electronic instrument systems
 - engine indication systems
 - the operation of built-in test equipment
 - on-board maintenance systems

- Integrated Modular Avionics and the interface with hydraulic, fuel and pneumatic systems.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware, and system test requirements as they relate to the work must be demonstrated before undertaking any action.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of avionic components, as listed in the Range of Conditions:
 - components/LRUs from electronic instrument systems
 - components/LRUs from engine indication systems
 - communication system components
 - navigation system components
 - software updates to avionic systems where serviceability can be determined by a simple test.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A344 Remove and install aircraft components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and standard trade practices in the removal and installation of fixed and rotary wing aircraft components during scheduled or unscheduled maintenance, including hydro-mechanical and mechanical components, and emergency equipment that is within the privileges of the A Licence.

This is one of the units required for the granting of the chosen maintenance certification A Licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Remove landing gear components | 1.1 The aircraft is jacked as specified in the maintenance manual for landing gear component removal |
| | 1.2 Removal of components is carried out in accordance with the applicable maintenance publications while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.3 Required maintenance documentation is accurately completed and correctly processed |
| | 1.4 Removed components are tagged, sealed and packaged in accordance with standard organisational procedures |
| 2. Remove hydro-mechanical components | 2.1 Hydro-mechanical system is rendered safe and prepared in accordance with the applicable maintenance publication, including fitment of isolation tags, where necessary, to ensure personal safety |
| | 2.2 Removal of hydro-mechanical components is carried out in accordance with the applicable maintenance publications while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 2.3 Required maintenance documentation is accurately completed and correctly processed |
| | 2.4 Removed components are tagged, sealed and packaged in accordance with standard organisational procedures |
| 3. Remove mechanical components/emergency equipment | 3.1 Applicable safety precautions are identified and observed for the removal and handling of components |

- 3.2 Removal of mechanical components/emergency equipment is carried out in accordance with the applicable maintenance publications while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 3.3 Required maintenance documentation is accurately completed and correctly processed
 - 3.4 Removed components and/or items of emergency equipment are tagged, sealed and packaged in accordance with standard organisational procedures
4. Install landing gear components
 - 4.1 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
 - 4.2 Component installation is carried out in accordance with applicable maintenance publications while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 4.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
5. Install hydro-mechanical components
 - 5.1 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
 - 5.2 Component installation is carried out in accordance with applicable maintenance publications while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 5.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
6. Install mechanical components/emergency equipment
 - 6.1 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
 - 6.2 Component installation is carried out in accordance with applicable maintenance publications while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 6.3 Required maintenance documentation is completed

and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Landing gear components include:

- Main and nose wheel assemblies
- Brake units

Hydro-mechanical components include:

- Toilet system components (excluding gate valves)
- Windscreen wiper blades

Mechanical components/emergency equipment includes:

- Passenger and crew seats, seat belts and harnesses
- Internal doors (excluding any doors that form part of the pressure hull)
- Trim panels, linings, cabin equipment and consoles
- Applicable emergency equipment, such as life jackets, rafts, location transmitters/beacons

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA344A Remove and install aircraft components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA344 Remove and install aircraft components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and PPE
- jacking of aircraft for landing gear component removal
- using hand skills and tools to perform component removal and installation tasks
- correctly installing and securing of aircraft hardware
- inspecting and correctly installing of bearings
- safe handling of heavy components
- using maintenance publications to prepare the aircraft for component removal and installation and correct interpretation of removal and installation instructions
- applying standard procedures.

The underlying skills inherent in this unit should be transferable into other units that require similar techniques. It is essential that system cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with.

This shall be demonstrated through application across a number of aircraft systems or aircraft types, but must cover a sufficient range of tasks to demonstrate familiarity with attachment methods, connection hardware and couplings peculiar to each type of system, and of safe handling of heavy components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- how to locate and correctly remove and install components
- how to locate and correctly remove and install items of emergency equipment
- WHS procedures relating to component removal and installation and handling of heavy components
- How to obtain PPE
- How to obtain MSDS

- relevant maintenance publications
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of system operation as it relates to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of CASA and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under supervision without intervention on at least one (1) component from each of the following groups:
 - main and nose wheel assemblies
 - brake units
 - toilet system components (excluding gate valves)
 - windscreen wiper blades
 - passenger and crew seats, seat belts and harnesses
 - internal doors (excluding any doors that form part of the pressure hull)
 - trim panels, linings, cabin equipment and consoles
 - applicable emergency equipment, such as life jackets, rafts, location transmitters/beacons.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA345 Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and standard trade practices in the performance of scheduled servicings up to the Weekly Check or equivalent, pre and post-flight servicing activities and the application of aircraft ground handling procedures on gas turbine engine fixed wing aircraft.

The unit is one of those required for the granting of the chosen maintenance certification A1 Licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Prepare for flight | 1.1 Aircraft is positioned as required |
| | 1.2 Ground locks, aircraft support and safety devices and covers are removed and stowed in accordance with maintenance documentation |
| | 1.3 Aircraft tie-down devices are removed and stowed/stored |
| 2. Inspect aircraft and systems | 2.1 Preparation of the aircraft and systems is appropriate to allow for proper inspection |
| | 2.2 Aircraft and systems are visually or physically checked for external signs of defects in accordance with applicable maintenance documentation while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 3. Replenish aircraft systems | 3.1 Fluid level checks and replenishments are carried out in accordance with maintenance documentation requirements |
| | 3.2 Maintenance of gaseous levels (oxygen, nitrogen and compressed air) is carried out in accordance with maintenance documentation requirements while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 3.3 Role equipment/components requiring pre-flight replacement are changed as required by maintenance documentation |
| | 3.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 4. Perform scheduled line maintenance checks | 4.1 Inspection requirements are determined from maintenance documentation |
| | 4.2 Aircraft structure and systems are visually inspected for |

external signs of defects in accordance with applicable maintenance documentation while observing all relevant WHS requirements, including the use of MSDS and items of PPE

- 4.3 Defects are recorded and reported in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Maintenance activities include, as applicable to the enterprise operating and maintenance system:

- Preparation for flight following maintenance
- Before flight servicing
- After flight servicing
- Turn around servicing
- Scheduled line maintenance activities up to the level of a Weekly Check or specified equivalent

Maintenance documentation includes:

- Maintenance manuals
- Servicing schedules
- Applicable airworthiness regulations
- Aircraft maintenance program

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA345A Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA345 Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- ground handling of aircraft
- using hand skills and tools to perform flight servicing activities
- correctly installing and securing of aircraft hardware
- locating, using and correctly stowing of aircraft safety and security equipment, including ground locks, covers, support and safety devices and tie-down devices
- applying ground power (where applicable)
- inspecting structure for damage and deterioration
- recognising external signs of component damage, leakage and security in aircraft systems
- recognising visual signs of damage, leakage and security with regard to engines and propellers (where applicable)
- refuelling the aircraft with the correct type, quantity and distribution of fuel
- checking and replenishing fluid level using the correct fluids
- recharging of gaseous levels using the correct support equipment and procedures
- lubricating components
- checking fire protection systems (where applicable) for correct gas charge levels
- replacing role equipment requiring pre-flight replacement
- using maintenance data and manuals to determine flight servicing requirements and procedures
- applying standard procedures
- observing all relevant WHS procedures, including the use of PPE and MSDS.

It is essential that the specific aspects of the aircraft flight servicing or scheduled line maintenance task are checked to ensure quality and safety standards are fully observed, understood and complied with. Safety precautions applicable to the system being maintained are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- aircraft structural concepts and structure to the extent required to be able to recognise typical types of structural damage and deterioration during flight servicing activities and scheduled inspections up to the level of a Weekly Check or equivalent
- system layout, operation and typical external signs of faults to the extent required to perform flight servicing and scheduled inspections up to the level of a Weekly Check or equivalent
- types and characteristics of fuels and fuel additives
- types and characteristics of lubricants
- types and characteristics of hydraulic fluids
- WHS procedures relating to flight servicing activities, including how to obtain PPE and MSDS
- basic theory of flight relating to fixed wing aircraft, including stability and control
- the function of on-board maintenance systems
- gas turbine engine and propeller basic theory, installation and operation
- relevant principles of mathematics and physics.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- Evidence of knowledge of system operation, recognition of defects and completion of documentation, the relationship of individual components and the links with other systems will be necessary to the extent required for completion of flight servicing and scheduled line maintenance task before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under supervision but without intervention on the following flight servicings and scheduled line maintenance tasks that are applicable to the enterprise operating and maintenance system:
 - preparation for flight following maintenance
 - before flight servicing
 - after flight servicing
 - turn around servicing

- scheduled line maintenance activities up to the level of a Weekly Check or specified equivalent.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA346 Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and standard trade practices in the performance of scheduled servicings up to the Weekly Check or equivalent, pre and post-flight servicing activities and the application of aircraft ground handling procedures on gas turbine engine rotary wing aircraft.

The unit is one of those required for the grant of the chosen maintenance certification A3 Licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Prepare for flight | 1.1 | Aircraft is positioned as required |
| | | 1.2 | Ground locks, aircraft support and safety devices and covers are removed and stowed in accordance with maintenance documentation |
| | | 1.3 | Aircraft tie-down devices are removed and stowed/stored |
| 2. | Inspect aircraft and systems | 2.1 | Preparation of the aircraft and systems is appropriate to allow for proper inspection |
| | | 2.2 | Aircraft and systems are visually or physically checked for external signs of defects in accordance with applicable maintenance documentation while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 3. | Replenish aircraft systems | 3.1 | Fluid level checks and replenishments are carried out in accordance with maintenance documentation requirements |
| | | 3.2 | Maintenance of gaseous levels (oxygen, nitrogen and compressed air) is carried out in accordance with maintenance documentation requirements while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 3.2 | Role equipment/components requiring pre-flight replacement are changed as required by maintenance documentation |
| | | 3.4 | Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 4. | Perform scheduled line maintenance checks | 4.1 | Inspection requirements are determined from maintenance documentation |
| | | 4.2 | Aircraft structure and systems are visually inspected for |

external signs of defects in accordance with applicable maintenance documentation while observing all relevant WHS requirements, including the use of MSDS and items of PPE

- 4.3 Defects are recorded and reported in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Maintenance activities include, as applicable to the enterprise operating and maintenance system:

- Preparation for flight following maintenance
- Before flight servicing
- After flight servicing
- Turn around servicing
- Scheduled line maintenance activities up to the level of a Weekly Check or specified equivalent

Maintenance documentation includes:

- Maintenance manuals
- Servicing schedules
- Applicable airworthiness regulations
- Aircraft maintenance program

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA346A Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA346 Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- ground handling of aircraft
- using hand skills and tools to perform flight servicing activities
- correctly installing and securing of aircraft hardware
- locating, using and correctly stowing of aircraft safety and security equipment, including ground locks, covers, support and safety devices, and tie-down devices
- applying ground power (where applicable)
- inspecting structure for damage and deterioration
- recognising external signs of component damage, leakage and security in aircraft systems
- recognising visual signs of damage, leakage and security with regard to engines, transmissions and rotors
- refuelling the aircraft with the correct type, quantity and distribution of fuel
- checking and replenishing fluid level using the correct fluids
- recharging of gaseous levels using the correct support equipment and procedures
- lubricating components
- checking fire protection systems (where applicable) for correct gas charge levels
- replacing role equipment requiring pre-flight replacement
- using maintenance data and manuals to determine flight servicing requirements and procedures
- applying standard procedures
- observing all relevant WHS procedures, including the use of PPE and MSDS.

It is essential that the specific aspects of the aircraft flight servicing or scheduled line maintenance task are checked to ensure quality and safety standards are fully observed, understood and complied with. Safety precautions applicable to the system being maintained are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- aircraft structural concepts and structure to the extent required to be able to recognise typical types of structural damage and deterioration during flight servicing activities and scheduled inspections up to the level of a Weekly Check or equivalent
- system layout, operation and typical external signs of faults to the extent required to perform flight servicing and scheduled inspections up to the level of a Weekly Check or equivalent
- types and characteristics of fuels and fuel additives
- types and characteristics of lubricants
- types and characteristics of hydraulic fluids
- WHS procedures relating to flight servicing activities, including how to obtain PPE and MSDS
- basic theory of flight relating to rotary wing aircraft, including stability and control
- the function of on-board maintenance systems
- gas turbine engine basic theory, installation and operation
- engine transmission and rotor basic theory, installation and operation
- relevant principles of mathematics and physics.

Assessment Conditions

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA347 Perform scheduled line maintenance activities on piston engine fixed wing aircraft

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and standard trade practices in the performance of scheduled servicings up to the Weekly Check or equivalent, pre and post-flight servicing activities and the application of aircraft ground handling procedures on piston engine fixed wing aircraft.

The unit is one of those required for the granting of the chosen maintenance certification A2 Licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Prepare for flight | 1.1 Aircraft is positioned as required |
| | 1.2 Ground locks, aircraft support and safety devices and covers are removed and stowed in accordance with maintenance documentation |
| | 1.3 Aircraft tie-down devices are removed and stowed/stored |
| 2. Inspect aircraft and systems | 2.1 Preparation of the aircraft and systems is appropriate to allow for proper inspection |
| | 2.2 Aircraft and systems are visually or physically checked for external signs of defects in accordance with applicable maintenance documentation while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 3. Replenish aircraft systems | 3.1 Fluid level checks and replenishments are carried out in accordance with maintenance documentation requirements |
| | 3.2 Maintenance of gaseous levels (oxygen, nitrogen and compressed air) is carried out in accordance with maintenance documentation requirements while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 3.3 Role equipment/components requiring pre-flight replacement are changed as required by maintenance documentation |
| | 3.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 4. Perform scheduled line maintenance checks | 4.1 Inspection requirements are determined from maintenance documentation |
| | 4.2 Aircraft structure and systems are visually inspected for |

external signs of defects in accordance with applicable maintenance documentation while observing all relevant WHS requirements, including the use of MSDS and items of PPE

- 4.3 Defects are recorded and reported in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Maintenance activities include, as applicable to the enterprise operating and maintenance system:

- Preparation for flight following maintenance
- Before flight servicing
- After flight servicing
- Turn around servicing
- Scheduled line maintenance activities up to the level of a Weekly Check or specified equivalent

Maintenance documentation includes:

- Maintenance manuals
- Servicing schedules
- Applicable airworthiness regulations
- Aircraft maintenance program

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA347A Perform scheduled line maintenance activities on piston engine fixed wing aircraft

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA347 Perform scheduled line maintenance activities on piston engine fixed wing aircraft

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- ground handling of aircraft
- using hand skills and tools to perform flight servicing activities
- correctly installing and securing of aircraft hardware
- locating, using and correctly stowing of aircraft safety and security equipment, including ground locks, covers, support and safety devices and tie-down devices
- applying ground power (where applicable)
- inspecting structure for damage and deterioration
- recognising external signs of component damage, leakage and security in aircraft systems
- recognising visual signs of damage, leakage and security with regard to engines and propellers
- refuelling the aircraft with the correct type, quantity and distribution of fuel
- checking and replenishing fluid level using the correct fluids
- recharging of gaseous levels using the correct support equipment and procedures
- lubricating components
- checking fire protection systems (where applicable) for correct gas charge levels
- replacing role equipment requiring pre-flight replacement
- using maintenance data and manuals to determine flight servicing requirements and procedures
- applying standard procedures
- observing of all relevant WHS procedures including the use of PPE and MSDS.

It is essential that the specific aspects of the aircraft flight servicing or scheduled line maintenance task are checked to ensure quality and safety standards are fully observed, understood and complied with. Safety precautions applicable to the system being maintained are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- aircraft structural concepts and structure to the extent required to be able to recognise typical types of structural damage and deterioration during flight servicing activities and scheduled inspections up to the level of a Weekly Check or equivalent
- system layout, operation and typical external signs of faults to the extent required to perform flight servicing and scheduled inspections up to the level of a Weekly Check or equivalent
- the function of on-board maintenance systems
- types and characteristics of fuels and fuel additives
- types and characteristics of lubricants
- types and characteristics of hydraulic fluids
- WHS procedures relating to flight servicing activities, including how to obtain PPE and MSDS
- basic theory of flight relating to fixed wing aircraft, including stability and control
- piston engine and propeller basic theory, installation and operation
- factors influencing piston engine performance
- relevant principles of mathematics and physics.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- Evidence of knowledge of system operation, recognition of defects and completion of documentation, the relationship of individual components and the links with other systems will be necessary to the extent required for completion of flight servicing and scheduled line maintenance task before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of CASA and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision but without intervention on the following flight servicings and scheduled line maintenance tasks that are applicable to the enterprise operating and maintenance system:
 - preparation for flight following maintenance
 - before flight servicing
 - after flight servicing

- turn around servicing
- scheduled line maintenance activities up to the level of a Weekly Check or specified equivalent
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA348 Perform scheduled line maintenance activities on piston engine rotary wing aircraft

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and standard trade practices in the performance of scheduled servicings up to the Weekly Check or equivalent, pre and post-flight servicing activities and the application of aircraft ground handling procedures on piston engine rotary wing aircraft.

The unit is one of those required for the grant of the chosen maintenance certification A4 Licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Prepare for flight | 1.1 | Aircraft is positioned as required |
| | | 1.2 | Ground locks, aircraft support and safety devices and covers are removed and stowed in accordance with maintenance documentation |
| | | 1.3 | Aircraft tie-down devices are removed and stowed/stored |
| 2. | Inspect aircraft and systems | 2.1 | Preparation of the aircraft and systems is appropriate to allow for proper inspection |
| | | 2.2 | Aircraft and systems are visually or physically checked for external signs of defects in accordance with applicable maintenance documentation while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 3. | Replenish aircraft systems | 3.1 | Fluid level checks and replenishments are carried out in accordance with maintenance documentation requirements |
| | | 3.2 | Maintenance of gaseous levels (oxygen, nitrogen and compressed air) is carried out in accordance with maintenance documentation requirements while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 3.3 | Role equipment/components requiring pre-flight replacement are changed as required by maintenance documentation |
| | | 3.4 | Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 4. | Perform scheduled line maintenance checks | 4.1 | Inspection requirements are determined from maintenance documentation |
| | | 4.2 | Aircraft structure and systems are visually inspected for external signs of defects in accordance with applicable |

maintenance documentation while observing all relevant WHS requirements, including the use of MSDS and items of PPE

- 4.3 Defects are recorded and reported in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Maintenance activities include, as applicable to the enterprise operating and maintenance system:**
- Preparation for flight following maintenance
 - Before flight servicing
 - After flight servicing
 - Turn around servicing
 - Scheduled line maintenance activities up to the level of a Weekly Check or specified equivalent
- Maintenance documentation includes:**
- Maintenance manuals
 - Servicing schedules
 - Applicable airworthiness regulations
 - Aircraft maintenance program
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA348A Perform scheduled line maintenance activities on piston engine rotary wing aircraft

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA348 Perform scheduled line maintenance activities on piston engine rotary wing aircraft

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- ground handling of aircraft
- using hand skills and tools to perform flight servicing activities
- correctly installing and securing of aircraft hardware
- locating, using and correctly stowing of aircraft safety and security equipment (includes ground locks, covers, support and safety devices and tie-down devices)
- applying ground power (where applicable)
- inspecting structure for damage and deterioration
- recognising of external signs of component damage, leakage and security in aircraft systems
- recognising of visual signs of damage, leakage and security with regard to engines, transmissions and rotors
- refuelling the aircraft with the correct type, quantity and distribution of fuel
- checking and replenishing fluid level using the correct fluids
- recharging of gaseous levels using the correct support equipment and procedures
- lubricating components
- checking fire protection systems (where applicable) for correct gas charge levels
- replacing role equipment requiring pre-flight replacement
- using maintenance data and manuals to determine flight servicing requirements and procedures
- applying standard procedures
- observing all relevant WHS procedures including the use of PPE and MSDS.

It is essential that the specific aspects of the aircraft flight servicing or scheduled line maintenance task are checked to ensure quality and safety standards are fully observed, understood and complied with. Safety precautions applicable to the system being maintained are to be fully observed. An understanding of system operation as it relates to the work must be demonstrated before undertaking any action.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- standard trade practices relating to tool usage and installation/securing of aircraft hardware
- aircraft structural concepts and structure to the extent required to be able to recognise typical types of structural damage and deterioration during flight servicing activities and scheduled inspections up to the level of a Weekly Check or equivalent
- system layout, operation and typical external signs of faults to the extent required to perform flight servicing and scheduled inspections up to the level of a Weekly Check or equivalent
- the function of on-board maintenance systems
- types and characteristics of fuels and fuel additives
- types and characteristics of lubricants
- types and characteristics of hydraulic fluids
- WHS procedures relating to flight servicing activities, including how to obtain PPE and MSDS
- basic theory of flight relating to rotary wing aircraft, including stability and control
- piston engine basic theory, installation and operation
- factors influencing piston engine performance
- engine transmission and rotor basic theory, installation and operation
- relevant principles of mathematics and physics.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using procedures, tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- Evidence of knowledge of system operation, recognition of defects and completion of documentation, the relationship of individual components and the links with other systems will be necessary to the extent required for completion of flight servicing and scheduled line maintenance task before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of CASA and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision but without intervention on the following flight servicings and scheduled line maintenance tasks that are applicable to the enterprise operating and maintenance system:
 - preparation for flight following maintenance
 - before flight servicing

- after flight servicing
- turn around servicing
- scheduled line maintenance activities up to the level of a Weekly Check or specified equivalent.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA351 Maintain airframe systems of basic light fixed wing aircraft

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot, and replace components of airframe systems of fixed wing aircraft that have fixed undercarriage and a normally aspirated engine driving a fixed pitch propeller, or a small gas turbine engine. This may be done during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|---|
| 1. | Inspect basic light fixed wing airframe systems | 1.1 | Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | | 1.2 | Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | | 1.3 | Airframe system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.4 | Defects are correctly identified and reported |
| 2. | Test/adjust basic light fixed wing airframe systems and components | 2.1 | Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | | 2.2 | Airframe system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | | 2.3 | System adjustment/rigging is performed in accordance with maintenance manual |
| 3. | Troubleshoot basic light fixed wing airframe systems | 3.1 | Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | | 3.2 | Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | | 3.3 | Specialist advice is obtained, where required, to assist |

- with the troubleshooting process
- 3.4 Airframe system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
 - 3.5 Rectification requirements are determined
4. Remove and install basic light fixed wing airframe system components
- 4.1 System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
 - 4.2 Airframe system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 4.3 Required maintenance documentation is accurately completed and correctly processed
 - 4.4 Removed components are tagged, sealed and packaged in accordance with specified procedures
 - 4.5 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
 - 4.6 Mass balance of control surfaces to be installed is checked in accordance with the applicable maintenance manual, if required
 - 4.7 Installation is carried out in accordance with the applicable maintenance manual
 - 4.8 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Maintenance documentation includes:**
- Servicing schedules
 - Maintenance manuals
- Airframe systems include:**
- Flight control systems
 - Fixed undercarriage shock absorbers
 - Master/slave cylinder brake systems
 - Fuel systems
 - Cabin heating systems
- Airframe system components include:**
- Ailerons, elevators, rudders, trim tabs, flaps and slats
 - Flight control wheels or sticks, cables, pulleys, guides, fairleads, bellcranks, rods, torque tubes, chains, sprockets, trim wheels or handles and rudder pedals or bars
 - Fixed undercarriage hydraulic and rubber shock absorbers
 - Wheels and brake units
 - Brake master cylinders and rigid or flexible plumbing
 - Rigid or flexible fuel tanks, selector/shutoff valves and rigid or flexible plumbing
 - Cabin heater ducting and control valves
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA351A Maintain airframe systems of basic light fixed wing aircraft

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA351 Maintain airframe systems of basic light fixed wing aircraft

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of airframe systems and components, including airframe system component removal and installation
- recognising system and component defects/external damage, correct installation and security for the range of airframe systems listed in the Range of Conditions
- removing, installing and rigging of flight controls
- checking flight control mass balance
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing all relevant WHS procedures, including the use of PPE and MSDS.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with airframe systems and components of basic light fixed wing aircraft. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This shall be demonstrated through application across a range of airframe systems and components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS precautions relevant to airframe system maintenance, including the use of PPE and MSDS
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components

- flight control system layout and operation
- theory of flight:
 - airflow
 - conditions of flight
 - lift and forces
 - drag
 - wings, tailplane and vertical stabiliser
 - lift augmentation (flaps, slats and slots)
 - aircraft control surfaces and their function (elevator, ailerons, rudder, elevons and trim tabs)
 - flight control balancing and flutter
 - stability and control and flight control rigging
- system layout and operation:
 - cockpit controls
 - cables and cable tensioning
 - pulleys and fairleads
 - bellcranks
 - levers
 - control surface horns
 - screwjacks
 - push/pull rods
- mechanical flight control system maintenance procedures and troubleshooting
- fixed undercarriage and shock absorber systems:
 - undercarriage configurations and types (tail wheel, tricycle and bicycle)
 - relative advantages of undercarriage configurations
 - steering systems
 - types of shock absorber (springs, leaf, coil, spring tube, rubber disc, bungee and oleo)
 - wheels and tyres
 - axles and wheel bearings
 - wheel spats
 - fixed undercarriage maintenance procedures and troubleshooting
- small aircraft brake systems:
 - types of brake system (mechanical and hydraulic)
 - master/slave cylinder hydraulic brake system operation
 - hydraulic fluids and seals
 - rigid and flexible plumbing
 - brake pads and shoes
 - brake discs and drums/linings
 - brake system maintenance procedures and troubleshooting
- cabin heater system layout and operation:

- heat source (muff heaters)
- ducting for heating and demisting
- valves and linkages
- fan
- cabin heating system maintenance procedures and troubleshooting
- fuel system layout and operation:
 - fuel tank types and location
 - selector valves and linkages
 - drain valves
 - rigid and flexible plumbing
 - fuel filters
 - boost pumps
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision as follows:
 - at least one (1) of each system:
 - flight control systems
 - fixed undercarriage shock absorbers
 - master/slave cylinder brake systems
 - fuel systems
 - cabin heating systems
 - a representative range of components from each of the following groups:
 - ailerons, elevators, rudders, trim tabs, flaps and slats
 - flight control wheels or sticks, cables, pulleys, guides, fairleads, bellcranks, rods, torque tubes, chains, sprockets, trim wheels or handles and rudder pedals or bars
 - fixed undercarriage hydraulic and rubber shock absorbers
 - wheels and brake units

- brake master cylinders and rigid or flexible plumbing
- rigid or flexible fuel tanks, selector/shutoff valves and rigid or flexible plumbing
- cabin heater ducting and control valves.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA352 Maintain basic rotary wing aircraft systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot, and replace components of rotor, rotor control systems and airframe systems of basic rotary wing aircraft during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include rotary wing aircraft that have mechanical control systems, either skids or floats and a normally aspirated engine.

This unit of competency is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Inspect rotor and rotor control systems and components | 1.1 | Isolation and warning signs are fitted/installed to the system or related systems and the aircraft configured for safe system inspection and operation in accordance with relevant aircraft publications/maintenance regulations orders and standards and practices |
| | | 1.2 | Rotor and rotor control system is visually or physically checked/inspected for external signs of defects in accordance with relevant aircraft publications maintenance regulations/orders and standards and practices while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.3 | Defects are identified and recorded in accordance with standard enterprise procedures |
| 2. | Inspect basic rotary wing airframe systems | 2.1 | Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | | 2.2 | Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | | 2.3 | Airframe system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 2.4 | Defects are correctly identified and reported |
| 3. | Ground test rotor and rotor control systems | 3.1 | Aircraft and system are prepared in accordance with relevant aircraft publications/maintenance regulations orders and standards and practices for the operation of |

- engine and rotor system
- 3.2 Rotor and rotor control system are functionally tested in accordance with relevant aircraft publications maintenance regulations/orders and standards and practices for evidence of malfunction
 - 3.3 System calibration or adjustments are performed in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
4. Test/adjust basic rotary wing airframe systems and components
 - 4.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
 - 4.2 Airframe system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction
 - 4.3 System adjustment is performed in accordance with maintenance manual
5. Troubleshoot rotor and rotor control systems
 - 5.1 Available information from aircraft maintenance documentation, inspection and test results is used to assist in fault determination
 - 5.2 Relevant aircraft publication fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level
 - 5.3 Specialist advice is obtained to assist with the troubleshooting process
 - 5.4 Rotor and rotor control system faults are located and the causes of the faults are clearly identified and recorded in aircraft maintenance documentation in accordance with standard enterprise procedures
 - 5.5 Fault rectification requirements are determined
6. Troubleshoot basic rotary wing airframe systems
 - 6.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination
 - 6.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting

- 6.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
 - 6.4 Airframe system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
 - 6.5 Rectification requirements are determined
7. Remove and install rotary wing rotor and rotor system components
- 7.1 System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices, and isolation and warning signs are installed/fitted to ensure personnel safety
 - 7.2 Rotor and rotor system component removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 7.3 Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 7.4 Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
 - 7.5 Rotor or rotor system component to be installed is checked to confirm correct part or model numbers, modification status and serviceability
 - 7.6 Mass balance of rotor blades/head is checked in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
 - 7.7 Installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
 - 7.8 Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage

8. Remove and install rotor control system components
- 8.1 System is rendered safe and prepared in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices, and isolation and warning signs are installed/fitted to ensure personnel safety
 - 8.2 Rotary wing flight control system component removal is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 8.3 Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 8.4 Removed components are labelled, sealed and packaged in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
 - 8.5 Rotary wing flight control system components to be installed are checked to confirm correct part or model numbers, modification status and serviceability
 - 8.6 Installation is carried out in accordance with relevant aircraft publications/maintenance regulations/orders and standards and practices
 - 8.7 Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
 - 8.8 Required aircraft maintenance documentation is completed and processed in accordance with standard enterprise procedures
9. Remove and install basic rotary wing airframe system components
- 9.1 System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
 - 9.2 Airframe system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 9.3 Required maintenance documentation is accurately

- completed and correctly processed
- 9.4 Removed components are tagged, sealed and packaged in accordance with specified procedures
 - 9.5 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
 - 9.6 Mass balance of control surfaces to be installed is checked in accordance with the applicable maintenance manual, if required
 - 9.7 Installation is carried out in accordance with the applicable maintenance manual
 - 9.8 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Rotor and rotor control system components include:

- Main rotor blades and tail rotor blades
- Rotor heads, swash plates and tail rotor pitch control assemblies
- Mechanical flight control components (collective and cyclic pitch levers, rudder pedals, cables, pulleys, guides, fairleads, bellcranks, rods, torque tubes, chains and sprockets)
- Main rotor, intermediate or tail rotor gearboxes
- Drive shafts and couplings
- Must be performed by a qualified pilot

Engine and rotor system operation:

Airframe systems include:

- Fuel systems

Airframe system components include:

- Cabin heating systems
- Rigid or flexible fuel tanks, selector/shutoff valves and rigid or flexible plumbing
- Cabin heater ducting and control valves

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA352A Maintain basic rotary wing aircraft systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA352 Maintain basic rotary wing aircraft systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of:
 - rotary wing mechanical control systems
 - helicopter airframe systems and components, including rotors and rotor system
- recognising system and component defects/external damage, correct installation and security for the range of airframe systems listed in the Range of Conditions
- removing, installing and rigging of rotor systems and rotor/flight controls
- removing and installing the range of airframe components listed in the Range of Conditions
- checking rotor mass balance
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing all relevant WHS procedures, including the use of PPE and MSDS.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with the, rotors, rotor control systems, airframe systems and components of basic rotary wing aircraft. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with.

Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This shall be demonstrated through application across a range of rotors, rotor control systems, airframe systems and components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS precautions relevant to airframe system maintenance, including the lifting and handling of heavy components and how to obtain PPE and MSDS
- standard trade practices relating to tool and test/rigging equipment usage and installation/securing of system components
- theory of flight:
 - airflow
 - conditions of flight
 - lift and forces
 - drag
- rotary flight principles:
 - terminology relating to:
 - aerofoils
 - main rotor blades
 - rotor discs
 - rotors (main and tail)
 - aerodynamic characteristics:
 - aerofoil design
 - forces
 - rotor thrust and power requirements
 - vortex ring
 - autorotation
 - helicopter stability
- helicopter dynamic components:
 - main rotors:
 - blades
 - heads
 - linkages
 - tail rotors
 - swash plates
 - transmissions and drive shafts
- helicopter structure and airframe systems:
 - structure and layout
 - engine and transmission
 - flight control system layout and operation
 - cabin heater system layout and operation
 - fuel system layout and operation
- helicopter maintenance procedures and troubleshooting

- relevant maintenance manuals
- relevant regulatory requirements and standard procedures, including requirements for engine and rotor system operation.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on groups listed in the Range of Conditions, as follows:
 - at least one (1) component from each of:
 - main rotor blades and tail rotor blades
 - rotor heads, swash plates and tail rotor pitch control assemblies
 - mechanical flight control components (collective and cyclic pitch levers, rudder pedals, cables, pulleys, guides, fairleads, bellcranks, rods, torque tubes, chains and sprockets)
 - main rotor, intermediate or tail rotor gearboxes
 - drive shafts and couplings
 - fuel systems
 - cabin heating systems
 - a representative range of components from:
 - rigid or flexible fuel tanks, selector/shutoff valves and rigid or flexible plumbing
 - cabin heater ducting and control valves.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA353 Maintain basic light aircraft engines and propellers

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications, and knowledge of piston engine and system theory to inspect, test and troubleshoot, remove and install normally aspirated piston engines and engine system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include normally aspirated piston engines of basic light fixed wing aircraft and basic rotary wing aircraft, and fixed pitch propellers.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Inspect piston engine system and components | 1.1 | Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual |
| | | 1.2 | Piston engine and components/systems are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 2. | Test piston engine | 2.1 | Aircraft and engine are correctly prepared in accordance with applicable maintenance manual |
| | | 2.2 | Assistance is provided with engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual |
| 3. | Troubleshoot piston engine | 3.1 | Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | | 3.2 | Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | | 3.3 | Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | | 3.4 | Piston engine faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required |
| | | 3.5 | Fault rectification requirements are determined to assist |

- in planning the repair
4. Remove piston engine and engine system components
 - 4.1 Aircraft is prepared and supported and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during engine removal
 - 4.2 Removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 4.3 Engine is tagged and prepared for transport or storage in accordance with the specified procedures
 - 4.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 5. Install piston engine and engine system components
 - 5.1 Engine to be installed is checked to confirm correct part or model numbers, modification status and serviceability
 - 5.2 Installation is carried out in accordance with the applicable maintenance manual
 - 5.3 Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
 - 5.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 6. Inspect and maintain fixed pitch propeller
 - 6.1 Engine is rendered safe for propeller inspection in accordance with maintenance manual or enterprise procedures
 - 6.2 Fixed pitch propeller is inspected for security, damage and deterioration in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 6.3 Metal propeller nicks and dents within damage limits are blended out in accordance with maintenance manual procedures

- | | |
|----------------------------------|---|
| 7. Remove fixed pitch propeller | 7.1 Engine is rendered safe and the aircraft is prepared for propeller removal in accordance with maintenance manual or enterprise procedures |
| | 7.2 Propeller is removed in accordance with maintenance manual procedures while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 7.3 Removed propeller is tagged and prepared for transport or storage in accordance with specified procedures |
| | 7.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 8. Install fixed pitch propeller | 8.1 Engine is rendered safe and the aircraft is prepared for propeller installation in accordance with maintenance manual or enterprise procedures |
| | 8.2 Propeller to be installed is checked to confirm correct part or number, modification status and serviceability |
| | 8.3 Installation is carried out in accordance with the applicable maintenance manual |
| | 8.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Piston engines and components/systems include:

- Normally aspirated engine (all types), main components and accessories/drives
- Control system

- Starter system
 - Fuel and air systems
 - Exhaust system
 - Oil system (if dry sump) (where applicable to the enterprise)
- Engine and/or system operation includes:**
- Testing of engines fitted to helicopters (where auxiliary drive is not available) shall be carried out through the applicant directing a pilot qualified on type
- Fixed pitch propellers:**
- Fixed pitch propeller may include a spinner and the propeller will be made from:
- metal
 - composite
 - wood
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA353A Maintain basic light aircraft engines and propellers

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA353 Maintain basic light aircraft engines and propellers

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation and aircraft manuals
- recognising external and internal signs of defects in piston engines, components and system components visual/physical inspection
- assisting with testing of piston engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
- compiling engine condition monitoring records
- rigging and adjusting engine controls and systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in piston engines and engine systems, clearly record details and identify the required rectification actions
- correctly removing and installing piston engine, engine components and fixed pitch propellers, including spinners
- inspecting propellers for security, damage and deterioration
- blending out metal propeller nicks and dents that are within maintenance manual limits.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing, troubleshooting and removal and installation tasks (including the timely involvement of supervisor or other trades) associated with engines, engine systems and fixed pitch propellers. It is essential that system testing procedures take into account all safety precautions associated with piston engine system operation, and that awareness be demonstrated of dual inspection requirements associated with work on engine controls.

This shall be demonstrated through application across a number of engine systems or types and propellers made from different materials. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures and functional rigging checks should also indicate knowledge of system operation.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS procedures associated with engine and propeller maintenance, including lifting and handling of heavy objects
- how to obtain MSDS
- use of PPE
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- fault diagnosis techniques
- piston engine and engine system layout and operation:
 - four stroke engine theory of operation and performance
 - cylinder configurations
 - construction (components and materials)
 - carburettors and air induction systems
 - fuel injection systems
 - fuels and their characteristics
 - ignition systems
 - lubricating systems and lubricants
 - cooling systems
 - exhaust systems
 - accessory drives and mounts
 - normally aspirated piston engine maintenance requirements and troubleshooting procedures
- system component operation, including electrical and instrument system interfaces:
 - magnetos and ignition harnesses
 - spark plugs
 - fuel pumps
 - fuel filters
 - oil pumps
 - oil filters
 - oil tanks
 - vacuum pumps
 - generators
 - starter motors
 - oil pressure gauges (direct reading)
 - temperature gauges (direct reading)
 - tachometers
 - manifold pressure gauges
 - maintenance requirements and troubleshooting procedures

- removal and installation procedures for piston engines and engine components:
 - removal procedures and handling
 - control linkages
 - electrical wiring
 - engine instrument connections
 - installation and rigging
 - ground running
 - system component removal, installation and system testing
- propellers, materials and damage and deterioration criteria:
 - fixed pitch propeller types, terminology and theory:
 - tractor/pusher
 - matching to engine and aircraft
 - leading edge/trailing edge
 - blade stations
 - forces acting on a propeller
 - propeller balance
 - materials and construction methods:
 - metal propeller metals, construction and surface protection
 - wooden propeller materials, construction and surface protection
 - composite propeller materials, construction and surface protection
 - damage and deterioration
 - methods of blending out of minor damage to metal propellers
- propeller removal and installation procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out rigging checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of:
 - normally aspirated engine (all types), main components and accessories/drives

- control system
- starter system
- fuel and air systems
- exhaust system
- oil system (if dry sump) (may be omitted where not applicable to the enterprise)
- and on at least one (1) type of fixed pitch propeller.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA354 Maintain light aircraft pneumatic systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test, troubleshoot and replace components of light aircraft pneumatic systems during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include light aircraft that have pneumatic systems where the air source is other than gas turbine engine bleed air. Bleed-air supplied pneumatic systems are covered by units MEA303 Remove and install aircraft pneumatic system components and MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Inspect light aircraft pneumatic systems | 1.1 | Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | | 1.2 | Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | | 1.3 | Components of pneumatic systems are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.4 | Defects are correctly identified and reported |
| 2. | Test/adjust light aircraft pneumatic systems and components | 2.1 | Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | | 2.2 | Pneumatic system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | | 2.3 | System adjustment is performed in accordance with maintenance manual |
| 3. | Troubleshoot light aircraft pneumatic systems | 3.1 | Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | | 3.2 | Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate |

- troubleshooting to line replacement level
- 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process
 - 3.4 Pneumatic system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
 - 3.5 Rectification requirements are determined
4. Remove and install light aircraft pneumatic system components
- 4.1 System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
 - 4.2 Pneumatic system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 4.3 Required maintenance documentation is accurately completed and correctly processed
 - 4.4 Removed components are tagged, sealed and packaged in accordance with specified procedures
 - 4.5 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
 - 4.6 Installation is carried out in accordance with the applicable maintenance manual
 - 4.7 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Pneumatic systems include:**
- De-icing systems, including de-icer boots on wings and tailplanes
- Pneumatic system components include:**
- Filters, valves, pumps, regulators and timers
 - Gauges (direct reading)
 - De-icer boots
 - Rigid and flexible pipelines, hoses and fittings
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA354A Maintain light aircraft pneumatic systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA354 Maintain light aircraft pneumatic systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of light aircraft pneumatic systems and components, including pneumatic system component removal and installation
- recognising pneumatic system and component defects/external damage, correct installation and security for the types of systems listed in the Range of Conditions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing of all relevant WHS procedures including the use of PPE and MSDS.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with light aircraft pneumatic systems and components. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This shall be demonstrated through application across pneumatic systems and components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS precautions relevant to light aircraft pneumatic system maintenance and how to obtain PPE and MSDS
- standard trade practices relating to tool and test equipment usage and installation/securing of system components
- types of light aircraft pneumatic system and components thereof:

- vacuum
- positive pressure
- high pressure
- pneumatic system layout, operation and characteristics and system component operation and construction, including electrical and instrument system interfaces
- how to configure the aircraft for inspection, testing and troubleshooting of pneumatic systems and components
- pneumatic system maintenance requirements and troubleshooting
- component attachment methods
- connection hardware and couplings
- electrical circuit isolation and plug removal and installation
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA355 Maintain light aircraft air cycle air conditioning systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test, troubleshoot and replace components of light aircraft air cycle air conditioning systems during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include unpressurised gas turbine engine-powered fixed and rotary wing light aircraft that have air cycle air conditioning systems. Where the aircraft has a pressurisation system the air conditioning and pressurisation systems are covered by MEA303 Remove and install aircraft pneumatic system components and MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201	Remove and install miscellaneous aircraft electrical hardware and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Inspect light aircraft air cycle air conditioning system | <p>1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements</p> <p>1.2 Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual</p> <p>1.3 Air cycle air conditioning system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)</p> <p>1.4 Defects are correctly identified and reported</p> |
| 2. Test/adjust light aircraft air conditioning systems and components | <p>2.1 Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation</p> <p>2.2 Air cycle air conditioning system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction</p> <p>2.3 System adjustment is performed in accordance with maintenance manual</p> |
| 3. Troubleshoot light aircraft air cycle air conditioning systems | <p>3.1 Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination</p> <p>3.2 Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level</p> <p>3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process</p> <p>3.4 Air cycle air conditioning system faults are located and</p> |

- the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required, in accordance with standard enterprise procedures
- 3.5 Rectification requirements are determined
4. Remove and install light aircraft air cycle air conditioning system components
- 4.1 System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
- 4.2 Air cycle air conditioning system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- 4.3 Required maintenance documentation is accurately completed and correctly processed
- 4.4 Removed components are tagged, sealed and packaged in accordance with specified procedures
- 4.5 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
- 4.6 Installation is carried out in accordance with the applicable maintenance manual
- 4.7 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Air cycle air conditioning system components include:**
- Valves and regulators
 - Heat exchangers, water separators and humidifiers
 - Expansion turbines
 - Rigid and flexible pipelines, hoses and fittings
 - Ducting
 - Temperature sensors, temperature controllers and electrical control circuit wiring/components
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA355A Maintain light aircraft air cycle air conditioning systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA355 Maintain light aircraft air cycle air conditioning systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of light aircraft air cycle air conditioning systems and components, including system component removal and installation
- recognising air cycle air conditioning system and component defects/external damage, correct installation and security for the types of system components listed in the Range of Conditions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing all relevant WHS procedures including the use of PPE and MSDS.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with light aircraft air cycle air conditioning systems and components. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This shall be demonstrated through application across air cycle air conditioning systems and components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS precautions relevant to light aircraft air cycle air conditioning system maintenance and how to obtain PPE and MSDS
- standard trade practices relating to tool and test equipment usage and installation/securing of system components
- air cycle air conditioning system:

- terminology
- layout
- operation, including component operation and construction
- electrical temperature control system components
- how to configure the aircraft for inspection, testing and troubleshooting of air cycle air conditioning systems and components
- air cycle air conditioning maintenance requirements and troubleshooting
- component attachment methods
- connection hardware and couplings
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- maintenance requirements and troubleshooting procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on an air cycle air conditioning system and on a representative range of the following components:
 - valves and regulators
 - heat exchangers, water separators and humidifiers
 - expansion turbines
 - rigid and flexible pipelines, hoses and fittings
 - ducting
 - temperature sensors, temperature controllers, and electrical control circuit wiring/components.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA356 Maintain light piston engine aircraft pressurisation systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test, troubleshoot and replace components of light piston engine aircraft pressurisation systems during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include all types of light fixed wing piston engine aircraft that have cabin pressurisation systems. Where aircraft types have pressurisation and air cycle air conditioning systems the applicable units are MEA208 Remove and install aircraft pressurisation control system components, MEA219 Inspect, test and troubleshoot aircraft pressurisation control systems and components, MEA303 Remove and install aircraft pneumatic system components and MEA310 Inspect, test and troubleshoot aircraft pneumatic systems and components.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201	Remove and install miscellaneous aircraft electrical hardware and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | |
|---|-----|---|
| 1. Inspect light piston engine aircraft pressurisation system | 1.1 | Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | 1.2 | Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | 1.3 | Pressurisation system components are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.4 | Defects are correctly identified and reported |
| 2. Test/adjust light piston engine aircraft pressurisation systems and components | 2.1 | Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | 2.2 | Pressurisation system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | 2.3 | System adjustment is performed in accordance with maintenance manual |
| 3. Troubleshoot light piston engine aircraft pressurisation systems | 3.1 | Available information from maintenance documentation, inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 | Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 | Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 | Pressurisation system faults are located and the causes of the faults are clearly identified and correctly recorded |

- in maintenance documentation, where required, in accordance with standard enterprise procedures
- 3.5 Rectification requirements are determined
4. Remove and install light piston engine aircraft pressurisation system components
- 4.1 System is rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety
- 4.2 Pressurisation system component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- 4.3 Required maintenance documentation is accurately completed and correctly processed
- 4.4 Removed components are tagged, sealed and packaged in accordance with specified procedures
- 4.5 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
- 4.6 Installation is carried out in accordance with the applicable maintenance manual
- 4.7 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Pressurisation system components include:

- Pressure controllers
- Outflow valves
- Safety valves

Procedures and requirements include:

- Negative pressure relief valves
- Ducting
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA356A Maintain light piston engine aircraft pressurisation systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA356 Maintain light piston engine aircraft pressurisation systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- using hand skills, tools and test equipment in the testing, adjustment and troubleshooting of light piston engine aircraft pressurisation systems and components, including system component removal and installation
- recognising pressurisation system and component defects/external damage, correct installation and security for the types of system components listed in the Range of Conditions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- effectively using maintenance documentation and relevant fault diagnosis guides in the troubleshooting process and for component removal and installation
- applying standard procedures
- observing all relevant WHS procedures including the use of PPE and MSDS.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with light piston engine aircraft pressurisation systems and components. It is essential that relevant procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This shall be demonstrated through application across pressurisation systems and components as listed in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS precautions relevant to light piston engine aircraft pressurisation system maintenance and how to obtain PPE and MSDS
- physiological aspects relating to high altitude flight:
 - human oxygen requirements and hypoxia

- human temperature requirements and hypothermia
- standard trade practices relating to tool and test equipment usage and installation/securing of system components
- sources of pressurised air (cabin supercharger, air pump or engine turbocharger)
- the relationship between cabin altitude and pressure differential and related structural limitations
- pressurisation system:
 - layout
 - operation and characteristics
 - system component operation and construction:
 - outflow valves
 - pressure controllers
 - safety valves
 - negative pressure relief valves
 - dump valves
 - ducting and outlets
 - electrical and instrument interfaces, including warning and cabin pressure indication systems
- interface with heating and air conditioning systems
- how to configure the aircraft for inspection, testing and troubleshooting of pressurisation systems and components
- pressurisation system maintenance requirements and troubleshooting
- component attachment methods
- connection hardware and couplings
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures
- maintenance requirements and troubleshooting procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of this unit of competency are being achieved under routine supervision on a pressurisation system and on a representative range of the following components:
 - pressure controllers
 - outflow valves
 - safety valves
 - negative pressure relief valves
 - ducting.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A357 Inspect, test and repair aircraft fabric surfaces

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, knowledge of fabric covering systems and maintenance publications to inspect, test and repair aircraft fabric surfaces during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include aircraft and aircraft components that are covered with fabric.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activities
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Inspect/test aircraft fabric surfaces | 1.1 Relevant maintenance documentation and modification status, including defect reports, where relevant, are used to identify specific inspection/testing requirements |
| | 1.2 Appropriate preparation and access to the aircraft structure is undertaken to allow for proper inspection in accordance with maintenance documentation |
| | 1.3 Aircraft fabric-covered surfaces are inspected/tested for signs of damage, deterioration or loss of tensile strength in accordance with maintenance documentation and approved procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.4 Damage or deterioration is assessed against limits specified by maintenance manual or other approved data to determine if repair, restoration or replacement is required |
| 2. Repair aircraft fabric surfaces | 2.1 Extent of damage is correctly assessed to assist in determining repair procedure |
| | 2.2 Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personal safety and freedom from damage |
| | 2.3 Appropriate repair scheme is identified in accordance with maintenance manual and/or approved data |
| | 2.4 All materials and equipment required are organised |
| | 2.5 Fabric repairs are performed in accordance with approved repair scheme ensuring that aircraft standard practices are used and process requirements are carried out while observing all relevant WHS requirements, |

- including the use of MSDS and items of PPE
- 2.6 Work area is cleaned of all waste material or contaminants
 - 2.7 Components are adjusted and/or re-balanced, where necessary, to operate within prescribed specifications
 - 2.8 Required maintenance/repair documentation is completed and processed in accordance with standard enterprise procedures
 - 2.9 Where required repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Fabric surfaces to be inspected and tested for:

- Blockage of drainage and water and dirt collection points
- Deterioration of finishing scheme
- Deterioration of fabric tensile strength
- Damage to inspection panels and zips

Repair of fabric surface includes:

- Surface rejuvenation
- Stitching
- Unsewed doped-on repair
- Correct application of finishing scheme
- Recognition of requirement to re-balance fabric-covered control surfaces after rejuvenation or repair of fabric covering

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA357A Inspect, test and repair aircraft fabric surfaces

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA357 Inspect, test and repair aircraft fabric surfaces

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the selection and use of PPE and MSDS
- using approved maintenance documentation and aircraft publications relating to aircraft fabric surfaces
- testing the soundness of fabric surfaces
- recognising and assessing fabric surface damage and deterioration
- recognising defective doping
- identifying and applying applicable repair and surface rejuvenation schemes.

The underlying skills inherent in this unit should be transferable across a range of inspection and testing applications associated with maintenance of aircraft fabric surfaces. It is essential that the procedures take into account all aircraft and personal safety precautions, especially with regard to the use of finishing scheme materials.

This shall be demonstrated through application across a range of aircraft fabric surfaces. Ability to interpret inspection, testing and repair procedures and specifications (allowable limits) and apply them in practice is critical.

The application of the procedures should also clearly indicate knowledge of structural flight loads.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS hazards associated with fabric covering processes and how to obtain relevant MSDS and use PPE
- regulatory requirements relating to the repair of fabric surfaces
- industry publications relating to the repair of fabric surfaces
- aircraft fabric surface covering and finishing materials and principles
- fabric-covered component attachment methods
- types of fabric and related characteristics
- types of tape, cord and thread and their relative advantages and disadvantages

- cements and finishing scheme materials, their characteristics, uses, storage requirements and related safety precautions
- inspection and testing requirements for existing fabric coverings and new fabric prior to use
- the criteria for fabric rejuvenation, repairs and repair methods, including the need for re-balancing of flight control surfaces after fabric rejuvenation or repair
- the application of flight loads to fabric-covered surfaces, and related failure mechanisms.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on all of the following:
 - inspection/testing for:
 - blockage of drainage and water and dirt collection points
 - deterioration of finishing scheme
 - deterioration of fabric tensile strength
 - damage to inspection panels and zips
 - repair of fabric surface:
 - by surface rejuvenation
 - by stitching
 - by unsewed doped-on repair
 - correct application of finishing scheme
 - recognition of requirement to re-balance fabric-covered control surfaces after rejuvenation or repair of fabric covering.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA358 Re-cover aircraft fabric surfaces

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, knowledge of fabric surfaces and maintenance publications to re-cover aircraft fabric surfaces and apply correct finishing schemes during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include aircraft and aircraft components that are covered with fabric.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | |
|--------------------------------------|-----|---|
| 1. Re-cover aircraft fabric surfaces | 1.1 | Required covering materials and methods are determined from maintenance manual and/or approved data |
| | 1.2 | Required finishing scheme is determined from |

- maintenance manual and/or approved data
- 1.3 Materials and equipment required are organised
 - 1.4 Necessary structure and system inspection and preparation prior to covering is correctly performed while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
 - 1.5 Fabric covering is correctly fabricated and attached to the structure
 - 1.6 Drainage holes are correctly created
 - 1.7 Applicable finishing scheme is correctly applied while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 1.8 Components are adjusted and/or re-balanced, where necessary, to operate within prescribed specifications
 - 1.9 Required maintenance/repair documentation is completed and processed in accordance with standard enterprise procedures
 - 1.10 Where required repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA358A Re-cover aircraft fabric surfaces

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA358 Re-cover aircraft fabric surfaces

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the correct selection and use of PPE and MSDS
- using approved maintenance documentation and aircraft publications relating to aircraft fabric surfaces
- inspecting structural members, wiring, grommets and system components and initiation of any necessary repair or rectification action
- fabricating and fitting fabric covering with appropriately placed inspection panels, zips and drainage holes
- applying fabric finishing scheme ready for paint
- recognising defective doping.

The underlying skills inherent in this unit should be transferable across a range re-covering applications associated with aircraft fabric surfaces. It is essential that the procedures take into account all aircraft and personal safety precautions, especially with regard to the use of finishing scheme materials.

This shall be demonstrated through application across a range of aircraft fabric surfaces. Ability to interpret re-covering procedures and specifications and apply them in practice is critical.

The application of the procedures should also clearly indicate knowledge of structural flight loads.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS hazards and how to obtain and use relevant MSDS and PPE
- regulatory requirements and industry publications relating to fabric covering of aircraft surfaces
- aircraft fabric surface covering and finishing materials and principles
- fabric-covered component attachment methods

- types of fabric and related characteristics
- types of tape, cord and thread and their relative advantages and disadvantages
- cements and finishing scheme materials, their characteristics, uses, storage requirements and related safety precautions
- fabric sewing techniques
- application techniques for cements and finishing schemes
- inspection and testing requirements for new fabric prior to use
- the need for re-balancing of flight control surfaces after re-covering, finishing scheme application and painting
- aircraft structure and system inspection requirements prior to re-covering with fabric
- the application of flight loads to fabric-covered surfaces, and related failure mechanisms
- the methods and procedures used (including doping and finishing) in re-covering components, such as wings, fuselages and control surfaces
- the requirements for the placement of inspection panels and zips, and for the creation of drainage holes.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least two (2) fabric surface re-covering tasks.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA359 Inspect and repair aircraft wooden structures

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of woodworking hand skills and knowledge and the use of maintenance publications to inspect and repair aircraft wooden structure and wooden components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|-----------------------------------|-----|---|
| 1. | Inspect aircraft wooden structure | 1.1 | Relevant maintenance documentation and modification status, including defect reports, where relevant, are used to identify specific inspection requirements |
| | | 1.2 | Appropriate preparation and access to the aircraft structure is undertaken to allow for proper inspection and testing in accordance with maintenance documentation |
| | | 1.3 | Aircraft wooden structure is visually or physically checked for signs of deterioration, deformation defects or damage in accordance with maintenance documentation and approved procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.4 | Damage or defects are assessed against damage or wear limits specified by structural repair manual or other approved data to determine if repair or replacement is required |
| 2. | Repair aircraft wooden structure | 2.1 | Extent of deterioration or damage is correctly assessed to assist in determining repair procedure |
| | | 2.2 | Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personal safety and freedom from damage |
| | | 2.3 | Appropriate repair scheme is identified in accordance with structural repair manual and/or approved data |
| | | 2.4 | Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage is beyond limits |
| | | 2.5 | All materials and equipment required are organised |
| | | 2.6 | Structural repairs are performed in accordance with approved repair scheme ensuring that aircraft standard practices are used and process requirements are carried |

- out while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- 2.7 Finishing scheme is restored while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- 2.8 Work area is cleaned of all waste material or contaminants
- 2.9 Components are adjusted, where necessary, to operate within prescribed specifications
- 2.10 Required maintenance/repair documentation is completed and processed in accordance with standard enterprise procedures
- 2.11 Where required, repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Inspection and testing requirements include:

- Drainage and water and dirt collection points
- Fabric covered plywood surfaces
- Single and double plywood skin
- Structural timbers and bolt holes
- Glued joint strength
- Glue lines

Inspection techniques include:

- Visual inspection
- Physical checks
- Mensuration and alignment

Components to be repaired include:

- Load carrying structural timbers
- Plywood skin

- Spars and ribs.
- Finishing scheme includes:**
- Refinishing of structure after repair using approved finishing scheme
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA359A Inspect and repair aircraft wooden structures

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA359 Inspect and repair aircraft wooden structures

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the correct selection and use of PPE and MSDS
- using approved maintenance documentation and aircraft publications relating to aircraft wooden structure
- identifying and using woodworking tools
- identifying aircraft structural timbers and their characteristics
- identifying potential causes of deterioration in wooden structural components
- identifying wooden structure defects and damage
- identifying the condition of glue lines
- fabricating and fitting repair members
- gluing of wooden structure
- restoring surface finish after repair.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing and repair applications associated with maintenance of aircraft wooden structures. It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure.

This shall be demonstrated through application across a range of aircraft wooden structures. Ability to interpret inspection and repair procedures and specifications (allowable limits) and apply them in practice is critical.

The application of the procedures should also clearly indicate knowledge of structural flight loads.

Knowledge Evidence

- Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:
- WHS hazards relating to wooden structure repair materials and how to obtain relevant MSDS and PPE

- aircraft wooden construction principles and inspection techniques
- wooden structural component attachment methods
- the effects of environmental factors on aircraft wooden structures
- wooden structure glues and application methods
- wooden component assembly methods and testing of joints
- wooden structure finishing schemes for exterior and interior surfaces
- the application of flight loads to aircraft wooden structural components and joints, and related failure mechanisms
- wooden component fabrication and repair techniques.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on all of the following:
 - inspection and/or testing of:
 - drainage and water and dirt collection points
 - fabric covered plywood surfaces
 - single and double plywood skin
 - structural timbers and bolt holes
 - glued joint strength
 - glue lines
 - inspection techniques must include visual inspection, physical checks, mensuration and alignment
 - repair of:
 - load carrying structural timbers
 - plywood skin
 - spars and ribs.
 - refinishing of structure after repair using approved finishing scheme.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA360 Maintain aircraft diesel engines

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications and knowledge of diesel engine and system theory to inspect, test and troubleshoot, remove and install aircraft diesel engines and engine system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include diesel engines fitted to light aircraft and driving fixed pitch propellers. Where the engine is driving a constant speed propeller, MEA307 Remove and install propeller systems and components and MEA315 Inspect, test and troubleshoot propeller systems and components, will also be required.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA353 Maintain basic light aircraft engines and propellers

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Inspect diesel engine and components/systems | 1.1 Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual |
| | 1.2 Diesel engine and components/systems are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 2. Test diesel engine | 2.1 Aircraft and engine are correctly prepared in accordance with applicable maintenance manual |
| | 2.2 Built-in system test functions and status displays are activated, where applicable, outputs recorded and interpreted |
| | 2.3 Assistance is provided with engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual |
| 3. Troubleshoot diesel engine | 3.1 Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | 3.2 Maintenance manual fault diagnosis guide, downloaded maintenance data (where applicable) and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | 3.3 Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | 3.4 Diesel engine faults are located and the causes of the faults are clearly identified and correctly recorded in |

- maintenance documentation, where required
- 3.5 Fault rectification requirements are determined to assist in planning the repair
4. Remove diesel engine and engine system components
- 4.1 Aircraft is prepared and supported and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during engine removal
- 4.2 Removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- 4.3 Engine is tagged and prepared for transport or storage in accordance with the specified procedures
- 4.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
5. Install diesel engine and engine system components
- 5.1 Engine to be installed is checked to confirm correct part or model numbers, modification status and serviceability
- 5.2 Installation is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- 5.3 Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage
- 5.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Diesel engines and components/systems include:

- Two and four stroke diesel aircraft engines, main components and accessories/drives
- Super/turbo charging systems

Control system, including full authority digital engine control (FADEC)

- Starter system
- Fuel and air systems
- Cooling system (liquid or air as applicable to enterprise)
- Exhaust system
- Oil system (if dry sump) (where applicable to the enterprise)

Engine testing includes:

- Testing of engines fitted to helicopters (where auxiliary drive is not available) shall be carried out through the individual directing a pilot qualified on type

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA360A Maintain aircraft diesel engines

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA360 Maintain aircraft diesel engines

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of PPE and MSDS
- using relevant maintenance documentation and aircraft manuals
- recognising external and internal signs of defects in aircraft diesel engines, components and system components through visual/physical inspection
- assisting with testing of diesel engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
- compiling engine condition monitoring records
- rigging and adjusting engine controls and systems, including FADEC systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in diesel engines and engine systems, clearly record details and identify the required rectification actions
- correctly removing and installing diesel engines and engine components.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing, troubleshooting and removal and installation tasks (including the timely involvement of supervisor or other trades) associated with diesel aircraft engines and engine systems. It is essential that system testing procedures take into account all safety precautions associated with diesel engine system operation (including interfaces with FADEC systems) and that awareness be demonstrated of dual inspection requirements associated with work on engine controls. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This shall be demonstrated through application across a number of engine systems or types.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS procedures associated with engine and propeller maintenance, including lifting and handling of heavy objects and how to obtain PPE and MSDS
- fault diagnosis techniques

- two and four stroke diesel aircraft engines and engine system layout and operation:
 - principles of operation of two and four stroke diesel engines
 - component function, construction and materials
 - engine operation
 - engine power, efficiency and performance
- diesel aircraft engine super/turbo charging systems
- diesel aircraft engine fuels and lubricating oils
- diesel fuel injection systems
- FADEC operation
- diesel aircraft engine induction systems
- diesel aircraft engine cooling systems (liquid and air)
- diesel aircraft engine exhaust systems
- system component operation, including electrical and instrument system interfaces
- dry sump lubrication systems
- removal and installation procedures for diesel aircraft engines and engine components
- diesel aircraft engine maintenance requirements and troubleshooting
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures and functional checks should indicate knowledge of system operation. Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out engine control system checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - two and four stroke diesel aircraft engines, main components and accessories/drives
 - super/turbo charging systems
 - control system, including FADEC (where applicable to enterprise)
 - starter system
 - fuel and air systems
 - cooling system (liquid or air as applicable to enterprise)

- exhaust system
- oil system (if dry sump) (may be omitted where not applicable to the enterprise).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA361 Maintain aircraft two stroke petrol engines

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications and knowledge of two stroke petrol engine and system theory to inspect, test and troubleshoot, remove and install aircraft two stroke petrol engines and engine system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include aircraft two stroke petrol engines driving fixed pitch propellers. Where the engine is driving a constant speed propeller, MEA307 Remove and install propeller systems and components and MEA315 Inspect, test and troubleshoot propeller systems and components, will also be required.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA353 Maintain basic light aircraft engines and propellers

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|---|
| 1. | Inspect two stroke petrol engine and components/systems | 1.1 | Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual |
| | | 1.2 | Two stroke petrol engine and components/systems are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 2. | Test two stroke petrol engines | 2.1 | Aircraft and engine are correctly prepared in accordance with applicable maintenance manual |
| | | 2.2 | Assistance is provided with engine and/or system operation during prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual |
| 3. | Troubleshoot two stroke petrol engines | 3.1 | Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | | 3.2 | Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | | 3.3 | Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | | 3.4 | Two stroke petrol engine faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required |
| | | 3.5 | Fault rectification requirements are determined to assist in planning the repair |

- | | | |
|--|-----|---|
| 4. Remove two stroke petrol engine and engine system components | 4.1 | Aircraft is prepared and supported and rendered safe in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during engine removal |
| | 4.2 | Removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 4.3 | Engine is tagged and prepared for transport or storage in accordance with the specified procedures |
| | 4.4 | Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 5. Install two stroke petrol engine and engine system components | 5.1 | Engine to be installed is checked to confirm correct part or model numbers, modification status and serviceability |
| | 5.2 | Installation is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 5.3 | Support/safety equipment is removed at the appropriate time to ensure personnel safety and freedom from structural damage |
| | 5.4 | Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Two stroke engines and components/systems include:

- Two stroke petrol aircraft engines, main components, including reduction gearboxes and accessories/drives
- Ignition systems
- Control systems
- Starter systems
- Fuel and air systems
- Cooling systems (liquid or air as applicable to enterprise)
- Exhaust systems

Testing of engines includes:

- Testing of engines fitted to helicopters (where auxiliary drive is not available) shall be carried out through the applicant directing a pilot qualified on type

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA361A Maintain aircraft two stroke petrol engines

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA361 Maintain aircraft two stroke petrol engines

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of PPE and MSDS
- using relevant maintenance documentation and aircraft manuals
- recognising external and internal signs of defects in two stroke petrol aircraft engines, components and system components through visual/physical inspection
- assisting with testing of two stroke petrol engine and engine system operation, be able to operate systems, monitor indications, record parameters and recognise correct function
- compiling engine condition monitoring records
- rigging and adjusting engine controls and systems
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in two stroke petrol engines and engine systems, clearly record details and identify the required rectification actions
- correctly removing and installing two stroke petrol engine and engine components.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing, troubleshooting and removal and installation tasks (including the timely involvement of supervisor or other trades) associated with two stroke petrol aircraft engines and engine. It is essential that system testing procedures take into account all safety precautions associated with two stroke petrol engine system operation and that awareness be demonstrated of dual inspection requirements associated with work on engine controls. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This shall be demonstrated through application across a number of engine systems or types.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS procedures associated with engine maintenance, including lifting and handling of heavy objects and how to obtain PPE and MSDS
- fault diagnosis techniques

- two stroke petrol aircraft engine layout and operation:
 - principles of operation of two stroke engines
 - component function, construction and materials
 - engine operation
 - engine power, efficiency and performance
- two stroke aircraft engine fuels, oils and fuel/oil mixing
- components, layout and operation of two stroke petrol aircraft engine:
 - fuel systems
 - ignition systems:
 - magneto
 - coil
 - spark plugs
 - ignition harnesses
 - switches
 - starting systems
 - induction systems
 - cooling systems (liquid and air)
 - exhaust systems
 - electrical and instrument system interfaces:
 - battery charging system
 - tachometer
- removal and installation procedures for two stroke petrol aircraft engines and engine components
- petrol two stroke aircraft engine maintenance requirements and troubleshooting
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures and functional checks should indicate knowledge of system operation. Engine system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out engine control system checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - two stroke petrol aircraft engines, main components, including reduction gearboxes and accessories/drives
 - ignition systems
 - control systems
 - starter systems
 - fuel and air systems
 - cooling systems (liquid or air as applicable to enterprise)
 - exhaust systems.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA362 Maintain aircraft vapour cycle air conditioning systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, the use of maintenance publications and knowledge of vapour cycle air conditioning systems to inspect, test and troubleshoot systems, and to remove and install mechanical and electrical system components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Compliance with applicable regulations is required where refrigerant evacuation and recharging is performed.

Applications include all aircraft vapour cycle air conditioning systems and components.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|----|--|-----|---|
| 1. | Inspect vapour cycle air conditioning systems | 1.1 | Isolation tags already attached to the system or related systems are checked and aircraft/engine configured for safe system inspection and operation in accordance with applicable maintenance manual |
| | | 1.2 | Vapour cycle air conditioning systems are visually or physically checked for external and internal signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| 2. | Test vapour cycle air conditioning systems | 2.1 | Aircraft and system are correctly prepared in accordance with applicable maintenance manual |
| | | 2.2 | Vapour cycle air conditioning system is tested in accordance with prescribed test procedures to establish serviceability and correct function in accordance with applicable maintenance manual |
| 3. | Troubleshoot vapour cycle air conditioning systems | 3.1 | Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | | 3.2 | Maintenance manual fault diagnosis guide and logical processes are used to ensure efficient and accurate troubleshooting to line replacement level |
| | | 3.3 | Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | | 3.4 | Vapour cycle air conditioning system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required |
| | | 3.5 | Fault rectification requirements are determined to assist in planning the repair |
| 4. | Remove vapour cycle air | 4.1 | Aircraft and vapour cycle air conditioning system is rendered safe in accordance with the applicable |

- | | |
|--|---|
| conditioning system components | maintenance manual and isolation tags are fitted, where necessary, to ensure the safety of personnel and freedom from damage during component removal |
| | 4.2 Where refrigerant evacuation is necessary, evacuation is performed in accordance with regulatory requirements and maintenance manual procedures |
| | 4.3 Component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 4.4 Component is tagged and prepared for transport or storage in accordance with the specified procedures |
| | 4.5 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 5. Install vapour cycle air conditioning system components | 5.1 Component to be installed is checked to confirm correct part or model numbers, modification status and serviceability |
| | 5.2 Installation is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 5.3 Vapour cycle air conditioning system is recharged with refrigerant, where necessary, in accordance with maintenance manual procedures and regulatory requirements |
| | 5.4 Vapour cycle air conditioning system is tested for correct function and freedom from refrigerant leaks if system recharging has been performed |
| | 5.5 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Vapour cycle air conditioning systems include:

- Refrigeration system compressor, condenser, receiver dryer, thermal expansion valve and evaporator
 - Magnetic clutch and drive system (belt, power take-off, electric motor, hydraulic motor or pneumatic as applicable)
 - Condenser extension and retraction system
 - Blower
 - Throttle system shutoff
 - Temperature control system
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA362A Maintain aircraft vapour cycle air conditioning systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA362 Maintain aircraft vapour cycle air conditioning systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the selection and use of applicable PPE and MSDS
- complying with regulatory requirements regarding the de-gassing of vapour cycle air conditioning systems
- using relevant maintenance documentation and aircraft manuals
- recognising external and internal signs of defects in vapour cycle air conditioning systems and system components through visual/physical inspection
- testing of vapour cycle air conditioning system operation, be able to operate systems and leak testing equipment, monitor indications and recognise correct function
- using specialist equipment to evacuate and recharge refrigerant
- using fault diagnosis guides and equivalent data to accurately and efficiently troubleshoot the causes of unserviceabilities in vapour cycle air conditioning systems, clearly recording details and identifying the required rectification actions
- correctly removing and installing vapour cycle air conditioning system electrical and mechanical components.

The underlying skills inherent in this unit should be transferable across a range of inspection, testing, troubleshooting and removal and installation tasks (including the timely involvement of supervisor or other trades) associated with vapour cycle air conditioning systems and components. It is essential that system testing procedures take into account all safety precautions associated with vapour cycle air conditioning system operation and testing, and that regulations relating to the evacuation and recharging of refrigerant be strictly observed. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

This shall be demonstrated through application across a number of aircraft vapour cycle air conditioning systems.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS procedures associated with vapour cycle air conditioning system maintenance, including the selection and use of PPE
- how to obtain applicable MSDS
- regulations applying to the evacuation and recharging of refrigerant
- fault diagnosis techniques
- vapour cycle air conditioning system layout and operation
- vapour cycle air conditioning system electrical and mechanical component operation:
 - compressor
 - condenser
 - receiver dryer
 - thermal expansion valve
 - evaporator
 - magnetic clutch and drive system:
 - belt
 - power takeoff
 - electric motor
 - hydraulic motor
 - pneumatic
 - condenser extension and retraction system
 - blower
 - throttle system shutoff
 - temperature control system
- refrigerant used in aircraft vapour cycle air conditioning systems
- lubricants used in compressors
- equipment used to test systems and evacuate and recharge refrigerant
- procedures for evacuating and recharging system refrigerant
- refrigerant leak testing techniques and equipment
- removal and installation procedures for vapour cycle air conditioning system components
- vapour cycle air conditioning system maintenance requirements
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.

- The application of testing procedures and functional checks should indicate knowledge of system operation and regulations relating to refrigerant. Vapour cycle air conditioning system operation knowledge, the relationship of individual components and the links with other systems will be necessary to supplement evidence of ability to carry out engine control system checks and troubleshoot the system within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a system and at least one (1) component in each of the following groups:
 - refrigeration system compressor, condenser, receiver dryer, thermal expansion valve and evaporator
 - magnetic clutch and drive system (belt, power takeoff, electric motor, hydraulic motor or pneumatic as applicable)
 - condenser extension and retraction system
 - blower
 - throttle system shutoff
 - temperature control system.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA364 Maintain and/or repair small aircraft mechanical components or parts

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of relevant maintenance publications to maintain and repair a range of aircraft mechanical components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include fixed and rotary wing aircraft classified by the Civil Aviation Safety Authority (CASA) as small aircraft and components in workshops.

The unit is part of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathway.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation safety regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. Maintain and/or repair mechanical components or parts | 1.1 Maintenance and/or repair requirements are determined, following disassembly and assessment of component parts for serviceability, in accordance with the relevant maintenance documentation |
| | 1.2 Tagging and repair instructions are accurately specified for parts requiring specialist repair |
| | 1.3 Appropriate materials, tools, equipment and assembly or fabrication jigs are selected and prepared for the particular specification requirements |
| | 1.4 Components or parts are maintained, repaired or modified as approved by relevant manufacturers' bulletins or procedures in accordance with required specifications |
| | 1.5 Mechanical component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.6 Mechanical components are adjusted, as required, to operate within prescribed specifications |
| | 1.7 Test equipment and rigs are used, where applicable, to confirm serviceability |
| | 1.8 Maintained/repaired or modified components are tagged, sealed and packaged within specified procedures |
| | 1.9 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

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| Components or parts to be maintained and/or repaired, if applicable to the enterprise, include: | <ul style="list-style-type: none"> • Hoses • Pipes • Cables, pulleys, chains, sprockets and gear drives • Control rods, bellcranks, links and screwjacks • Trim panels; linings; seats; cabin equipment and consoles; coverings; and emergency equipment stowage, including passenger escape systems, life jackets, rafts, location transmitters, cargo, crew and/or passenger seat restraints |
| Maintain includes: | <ul style="list-style-type: none"> • Cleaning, inspection for wear or damage and adjustment and lubrication, where applicable |
| Repair includes: | <ul style="list-style-type: none"> • Standard techniques for pipes and replacement of eye-ends, tubes or bearings for control rods/pulleys/sprockets and bushes or bearings for bellcranks and links • The use of adhesives and appropriate patch materials for trim and upholstery repairs (more extensive repairs involving sewing are covered by MEA509 Manufacture, repair and alter aircraft-related fabric components) • Replacement of restraint system components where sewing is not required (more extensive repairs are covered by MEA508 Maintain, install and remove restraint systems) |
| Procedures and requirements include: | <ul style="list-style-type: none"> • Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise |

Unit Mapping Information

Release 1 – equivalent to MEA364A Maintain and/or repair small aircraft mechanical components or parts

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA364 Maintain and/or repair small aircraft mechanical components or parts

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- applying relevant WHS practices including the selection and use of PPE and MSDS
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and repair requirements for the range of components listed in the Range of Conditions that are applicable to the enterprise
 - identify requirements and complete repairs and/or modifications
 - test and/or adjust components as required
- correctly tagging, sealing and packaging completed components that are not being immediately refitted.

The underlying skills inherent in this unit should be transferable across a range of maintenance and repair applications associated with aircraft components. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- mechanical component operation and repair procedures and processes:
 - hoses
 - pipes
 - cables, turnbuckles and tensioning devices
 - pulleys
 - chains and sprockets
 - gear drives
 - screwjacks

- control rods
- bellcranks
- links
- internal fittings and emergency equipment operation, construction, installation and maintenance/repair:
 - trim panels
 - linings and coverings
 - seats and crew/passenger restraints
 - cargo restraints
 - cabin equipment and consoles
- emergency equipment inspection and stowage requirements:
 - passenger escape systems
 - life jackets
 - rafts
 - emergency location transmitters
- applicable WHS procedures, including the selection and use of items of PPE
- how to obtain relevant MSDS
- how to identify suitable adhesives and patching materials for upholstery and trim
- inspection and test requirements for restraint system components
- safe stowage requirements for items of emergency equipment
- how to determine serviceability of items of emergency equipment
- relevant maintenance manuals, standards and specifications
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general and special-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Ability to assess component serviceability and interpret parts requirements will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the components or parts that are applicable to the enterprise, from each of the following groups:
 - hoses
 - pipes
 - cables, pulleys, chains, sprockets and gear drives
 - control rods, bellcranks, links and screwjacks

- trim panels; linings; seats; cabin equipment and consoles; coverings; and emergency equipment stowage, including passenger escape systems, life jackets, rafts, location transmitters, cargo, crew and/or passenger seat restraints).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA365 Assess structural repair/modification requirements and evaluate structural repairs and modifications

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires interpretation of structural repair and modification data to determine required action and to determine the compliance with airworthiness requirements of completed structural repairs or modifications. In addition, the performance of colour contrast dye penetrant non-destructive testing (NDT) on applicable components is included.

Applications include both fixed and rotary wing aircraft.

The unit covers some of the competencies required to progress from an Aircraft Maintenance Engineer (AME) at Certificate IV to the granting of a chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

The skills and knowledge covered by the units of competency listed in the MEA Aeroskills Training Package for Aircraft Maintenance Engineer at Certificate IV are prerequisite to the attainment of the elements of competency specified in this unit. This includes full coverage of the CASR Part 66 Syllabus subjects/topics listed in the Companion Volume CASA Interface.

Pre-requisite Unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. Assess structural repair or modification | 1.1 Structural repair requirements are determined from |
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| requirements | maintenance manuals or approved repair schemes |
| | 1.2 Damage beyond repair scheme limits is referred to relevant personnel/authorities |
| | 1.3 Modification requirements are determined from approved drawings and specifications/ instructions or requirements are referred to relevant personnel/authorities |
| | 1.4 Completed work is evaluated for compliance with airworthiness requirements |
| 2. Perform colour contrast dye penetrant NDT | 2.1 Inspection requirements are identified from relevant maintenance data or to confirm a visually identified defect |
| | 2.2 Surfaces to be inspected are prepared for the dye penetrant process |
| | 2.3 Dye penetrant materials are selected in accordance with standard operating procedures |
| | 2.4 Penetrant test is performed in accordance with standard operating procedures and while observing all relevant work health and safety (WHS) precautions |
| | 2.5 Defect indications are checked and identified in accordance with standard operating procedures |
| | 2.6 Penetrant testing equipment is correctly maintained and stored while observing all relevant WHS requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 2.7 Results are recorded in accordance with standard enterprise and regulatory requirements |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Range of tasks and practices includes:

- Standard practices for structural repair and modification, including damage measurement and assessment against approved repair schemes
- The process for referral of damage details and modification requirements to relevant personnel/authorities
- Supervision of repair scheme and modification incorporation, including evaluation of work against drawings and specifications
- Scheduled or unscheduled maintenance
- Individual activities or supervision of other personnel performing maintenance tasks classified in CASR part 145 as specialist maintenance, including:
 - non-destructive inspection
 - welding
 - surface plating
 - surface finishing
 - preparing structural repair components
 - machining

Surface preparation for dye penetrant NDT includes:

- Removal of surface finishes where applicable
- Thorough cleaning of the surface
- Drying of the surface
- Processes included in standard procedures

Dye penetrant materials include:

- Appropriate surface cleaning materials
- Emulsifiers
- Developers
- Materials for surface cleaning after testing

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA365A Assess structural repair/modification requirements and evaluate structural repairs and modifications

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA365 Assess structural repair/modification requirements and evaluate structural repairs and modifications

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- interpreting damage limits and identifying applicable repair schemes
- interpreting all requirements of modification drawings and assessing work against them
- evaluating completed repairs and modifications for compliance with the applicable data and with airworthiness requirements
- recognising weld defects
- performing colour contrast dye penetrant NDT to confirm defects in applicable aircraft components
- application of relevant WHS practices, including the use of MSDS and PPE.

The underlying skills inherent in this unit should be transferable across a range of repair and modification applications related to the structure of aircraft. It is essential that the repair and modification procedures take into account all applicable safety precautions. The ability to interpret repair scheme and modification requirements, including applicable specifications (allowable limits) and ensure that they are applied in practice is critical.

This must be demonstrated through the correct determination of repair requirements and the determination of compliance with repair schemes and modification drawings.

The ability to assess sound weld repairs must also be demonstrated.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge at a post-trade level of:

- application of regulatory requirements and of manufacturer's requirements in the determination of structural maintenance needs
- assessment of the extent of damage and an understanding of the need for a professional engineer to develop or extend a repair scheme where damage is beyond the limits of maintenance manual repair schemes, including the identification of relevant personnel and authorities

- assessment of new equipment or component mounting requirements and an understanding of the need to have drawings and specifications developed by a professional engineer, including the identification of relevant personnel and authorities
- the need for shoring and support to maintain aerodynamic shape and for safe performance of structural maintenance
- the need for mensuration checks and the techniques used to perform them
- how to determine welding requirements and the recognition of sound welds
- the correct application of colour contrast dye penetrant NDT and the limitations of the testing method
- dye penetrant test procedures:
 - relevant WHS precautions and how to obtain PPE and MSDS
 - cleaning and preparation processes and materials
 - consequences of incorrect preparation
 - basic concepts and principles of NDT and appropriate use of the colour contrast dye penetrant technique
 - general properties of penetrants (penetrability, removability and visibility)
 - types of emulsifiers and developers
 - established procedures and techniques
 - defect types and their consequences
 - post-test cleaning methods
- aircraft welding regulations
- aircraft welding processes and relevant parent metal groups
- defects applicable to each welding process and parent metal group.

Assessment Conditions

- Competency will be assessed in the training environment using a combination of practical exercises and scenarios. Applicable work plans should take account of applicable safety (including safe handling of heavy components) and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the elements and performance criteria of the unit of competency are being achieved across the tasks and practices listed in the Range of Conditions under supervision without intervention.
- This shall be established via simulated activities at the CASR Part 147 Maintenance Training Organisation and performance during observed workplace activities.
- The Assessor must meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA366 Perform borescope inspections

Modification History

Release 1 - New unit of competency

Application

This unit of competency is applied in conjunction with units relating to the inspection, testing and troubleshooting of piston engines and gas turbine engines (either installed in aircraft or in workshops), to perform and assess the results of remote visual inspections using borescopes.

The unit is required for the grant of approval for Aircraft Maintenance Engineers to perform borescope inspections on aircraft system components and engines during scheduled or unscheduled maintenance.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA313 Inspect, test and troubleshoot piston engine systems and components

OR

MEA314 Inspect, test and troubleshoot gas turbine engine systems and components

OR

MEA322 Test and troubleshoot gas turbine engine systems and components

OR

MEA387 Test gas turbine engines and engine modules after overhaul or repair

OR

MEA388 Repair and/or overhaul piston engines

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.	Set up borescope equipment	1.1	Applicable borescope equipment is obtained and assembled for use
		1.2	Assembled borescope equipment is tested for correct operation
2.	Perform borescope inspection	2.1	Component or engine is prepared for safe borescope inspection in accordance with applicable maintenance data
		2.2	Borecope inspections are performed in accordance with applicable maintenance data or standard operating procedures
3.	Record and assess borescope inspection results	3.1	Borecope inspection results are recorded and processed in accordance with standard enterprise procedures for the applicable borescope equipment
		3.2	Identified defects are recorded and reported in accordance with standard enterprise procedures
4.	Maintain and re-pack borescope equipment for storage	4.1	Borecope equipment is disassembled, maintained and cleaned in accordance with manufacturer's instructions
		4.2	Borecope equipment is replaced in transport or storage containers and stored in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Borescope equipment includes:

- Rigid optical borescopes
- Flexible optical borescopes
- Video borescopes
- Camera attachments for optical borescopes
- Remote engine rotation equipment

Applicable maintenance data includes:

- Borecope user manuals
- Engine maintenance manuals
- Servicing schedules
- Regulatory requirements, such as Airworthiness Directives or Special Technical Instructions

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA366A Perform borescope inspections

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA366 Perform borescope inspections

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- selecting applicable borescope equipment and assembling it for use
- identifying required borescope inspections and required techniques using applicable maintenance data
- setting up the applicable system component or engine in accordance with applicable maintenance data for safe borescope inspection
- applying borescope inspection techniques to safely perform required inspections without damage to engine components
- identifying and correctly assessing and reporting/recording defect indications
- maintaining and correctly storing borescope equipment after use.

The underlying skills inherent in this unit should be transferable across a range of remote visual inspection applications associated with internal engine components. It is essential that inspection procedures take into account all safety precautions associated with borescope inspection techniques and the applicable engine.

This shall be demonstrated through application across a representative range of borescope inspection tasks that are performed within the enterprise. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- types of borescope and their applications
- how to assemble borescope equipment and prepare it for use
- use of associated imaging and recording equipment, such as video and digital camera
- use of maintenance data to identify borescope inspection requirements
- borescope inspection techniques and safety
- remote engine rotation equipment
- defect assessment techniques
- borescope inspection reporting and recording requirements

- borescope maintenance and storage requirements.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Demonstrated knowledge of both borescope inspection techniques and of the subject engine will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of the borescope inspection tasks performed within the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement, or where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA367 Repair/modify aircraft composite structure using cold bonding

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications, applicable materials, tools and methods to repair aircraft composite material structure and components using cold cure repair techniques either on-aircraft or in the workshop during scheduled or unscheduled maintenance.

The unit is part of the Aeroskills Structures Maintenance Certificate IV training pathway, and of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA401 Inspect aircraft structures

OR

MEA339 Inspect, repair and maintain aircraft structures

OR

MEA369 Inspect and maintain structures and related components of non-pressurised small aircraft

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Plan repair/modification | 1.1 Extent of damage is correctly assessed to assist in determining repair procedure |
| | 1.2 Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage |
| | 1.3 Appropriate modification or repair scheme is identified in accordance with structural repair manual and/or approved data |
| | 1.4 Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage criteria are out of limits |
| | 1.5 All materials and equipment required are organised |
| 2. Repair/modify components using cold cure | 2.1 Lay-up of materials is checked to confirm that components meet required specifications and bagging equipment is correctly installed and operated |
| | 2.2 Curing cycle is regularly monitored to ensure required specifications are met |
| | 2.3 Components are checked for blemishes or delamination in accordance with quality procedures |
| | 2.4 Component assemblies requiring further or special treatment are made ready for the appropriate processes |
| | 2.5 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| | 2.6 Completed assemblies are tagged, sealed or packaged as required |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Applicable materials and methods include:**
- Cold cure or wet lay-up (using either fibreglass or carbon graphite)
 - Core materials (using one of aluminium, nomex or foam)
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA367A Repair/modify aircraft composite structure using cold bonding

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA367 Repair/modify aircraft composite structure using cold bonding

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and applicable items of PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying composite component applications in aircraft structures
- identifying various aircraft composite materials/resins and their basic properties by interpretation of markings and visual means
- handling and storing of composite materials to industry standards
- assessing composite component damage using visual and tap test methods
- relative advantages and disadvantages of hot and cold cure
- performing composite component repairs using cold cure adhesives:
 - external patch repair
 - scarf repair
 - stepped repair
 - wet lay-up repair
 - composite fastener hole repair
 - metal to metal and metal to composite bonding
- correctly interpreting and/or producing repair scheme/modification drawings/sketches
- using appropriate hand tools and machines to disassemble and assemble aircraft composite components, parts, sections and skin, including extraction/installation equipment, drilling/cutting equipment, and material fasteners.

The underlying skills inherent in this unit should be transferable across the range of different material applications applicable to cold curing. It is essential that specific aspects of the laying up and curing process for aircraft composite materials are checked to ensure quality and safety standards are achieved in this area. Correct checking and wearing of PPE is critical.

Evidence of knowledge about repair techniques and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake component repair. Ability to apply different materials and curing cycles, including composite to composite and composite to metal components, will be necessary to indicate competency in preparing and curing composite materials.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft construction principles and the causes of structural damage, including metal fatigue and corrosion
- structural fatigue preventative measures
- composite terminology and materials used in both hot and cold bonding
- composite component construction and repair methods, including structural assembly fastener types, specifications and identification
- procedures for the design and approval of repair schemes and modifications
- composite material storage requirements
- sealants used in aircraft structure and their application and handling
- paints and finishes for composite structure
- WHS precautions associated with repair of aircraft structure
- MSDS
- PPE.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency and the performance criteria are being achieved under routine supervision using materials from each of:
 - cold cure or wet lay-up (using either fibreglass or carbon graphite)
 - core materials (using one of aluminium, nomex or foam)
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA368 Shot peen aircraft components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of relevant process documentation to shot peen aircraft components, such as structural components and components of engines, propellers and landing gear shock struts from fixed and rotary wing aircraft during scheduled or unscheduled maintenance.

The unit is part of the Mechanical Certificate IV training pathway and is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|---|
| 1. | Prepare for shot peening task | 1.1 | Process documentation is obtained and correctly interpreted |
| | | 1.2 | Shot peening equipment is prepared in accordance with the applicable process |
| 2. | Apply shot peening process to Almen strip | 2.1 | The correct Almen strip is selected and fitted and equipment set up with the correct stand-off distance and regulated air pressure or spindle speed in accordance with the process documentation |
| | | 2.2 | Applicable work health and safety (WHS) provisions are observed, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE) |
| | | 2.3 | The process is correctly applied to the Almen strip |
| | | 2.4 | The Almen strip distortion is measured to ensure that it is within the specified tolerance |
| | | 2.5 | Equipment settings are adjusted and the Almen strip test repeated, if required |
| | | 2.6 | Settings that produce specified Almen strip distortion are recorded and the test strip is presented for inspection |
| 3. | Apply shot peening process to component | 3.1 | The component is cleaned and masked in accordance with process documentation |
| | | 3.2 | Shot peening is applied in accordance with the process documentation using equipment settings derived from Almen test strip and while observing all WHS requirements, including use of MSDS and PPE |
| | | 3.3 | The shot peened surface is checked for required density and coverage and re-peened, if necessary |
| | | 3.4 | The shot peened component is checked for cleanliness to ensure that all contaminants have been removed in accordance with the process documentation |

- | | | | |
|----|----------------------------|-----|--|
| 4. | Complete shot peening task | 4.1 | Task completion is recorded in accordance with standard enterprise procedures |
| | | 4.2 | Shot peened component is presented for inspection, along with Almen test strip and completed documentation |
| | | 4.3 | Where applicable, the component is tagged, sealed or packaged in accordance with specified procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Shot peening equipment includes:

- Air pressure or rotor propulsion of shot and either fixed or portable shot peen units

Stand-off distance applies to:

- nozzle distance from surface for air pressure shot peening processes, or
- spindle distance from job for rotor shot peening

Regulated air pressure or spindle speed:

- The specified air pressure applied to the shot nozzle or the specified revolutions per minute (r.p.m.) of the spindle in the rotor peening process

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA368A Shot peen aircraft components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA368 Shot peen aircraft components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and applicable items of PPE
- using relevant process documentation relating to shot peening of component surfaces to:
 - select and set up the required shot peening equipment
 - select and set up the Almen test strip
 - adjust equipment settings to obtain the required Almen strip distortion
 - prepare component surfaces for shot peening
 - shot peen surfaces to obtain the specified intensity and coverage
 - remove surface contaminants from shot peened surfaces
- correctly disposing of waste shot peening media.

The underlying skills inherent in this unit should be transferable across a range of shot peening applications associated with aircraft components. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved.

Evidence of transferability of skills and knowledge related to shot peening is essential. This shall be demonstrated through application across a number of different aircraft components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the correct use of PPE
- WHS procedures
- the reasons for shot peening
- the types of aircraft component and the materials that are shot peened
- shot peening equipment and processes applicable to aircraft components
- the uses of different types of shot peening media
- the use of process documentation
- the types of Almen test strips and their uses

- setting up and calibrating equipment for use
- preparation of surfaces for peening and cleaning after peening
- environmental requirements associated with disposal of used media.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using equipment specified in process documentation. It is also expected that general and special purpose tools and test equipment found in most routine situations would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Ability to obtain and correctly interpret shot peening process documentation will be necessary before undertaking any action.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of shot peening tasks that are performed within the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME369 Inspect and maintain structures and related components of non-pressurised small aircraft

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of procedures and techniques associated with the inspection and maintenance of non-pressurised small aircraft structures during scheduled or unscheduled maintenance, including special inspections required after events, such as heavy landings, overstress or flight through heavy turbulence.

The unit also covers the performance of a limited range of minor metal and composite repairs that are classified as elementary maintenance. Also required is an application of procedures and techniques associated with the removal and installation of related structural and non-structural components, including items such as internal trim, seats and emergency equipment. Work may be performed individually or as part of a team.

The unit is part of the Aeroskills Mechatronics Certificates III and IV small aircraft maintenance training pathways.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--------------------------------|---|
| 1. Inspect aircraft structure | 1.1 Relevant maintenance documentation is used to identify specific inspection requirements |
| | 1.2 Appropriate preparation and access to the aircraft structure is undertaken to allow for proper inspection in accordance with maintenance documentation |
| | 1.3 Aircraft structure is visually or physically checked for signs of deformation defects or damage in accordance with maintenance documentation and approved procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.4 Damage or defects are assessed against damage or wear limits specified by structural repair manual or other approved data to determine if repair or replacement is required |
| | 1.5 Maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. Maintain aircraft structure | 2.1 Minor repairs classified as elementary maintenance are performed in accordance with approved repair methods ensuring that aircraft standard practices are used and process requirements are carried out while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 2.2 Preventative maintenance techniques are employed to preserve the integrity of aircraft structure |

- 2.3 Work area is cleaned of all waste material or contaminants
- 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
- 3. Remove components
 - 3.1 Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage to aircraft or component during component removal
 - 3.2 Component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 3.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 3.4 Where applicable, removed components are tagged and prepared for transport in accordance with specified procedures
- 4. Install components
 - 4.1 Structural and/or non-structural components to be installed are checked to confirm correct part numbers, serviceability and modification status
 - 4.2 Component installation is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 4.3 Support/safety equipment is removed at an appropriate time to ensure personnel safety and freedom from structural damage
 - 4.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Inspection of aircraft structure and removable components of structure include:

- Non-ferrous and ferrous alloys and composite (FRP) materials used in aircraft construction
- Structural fastening and attachment hardware and/or devices
- Seals and sealants
- Glass and moulded plastics
- Preparation for application of non-destructive testing (NDT) techniques
- Doors, hinges and locking mechanisms for damage/misalignment
- Inspections applicable to each of safe life, damage tolerant and fail safe structure relevant to enterprise
- Ageing aircraft inspection programs
- Inspection after abnormal events

Damage or defects include:

- Impact damage
- Fatigue cracking
- Corrosion
- Delamination of composites and bonded structures

Minor repairs include:

- Performing minor repair tasks classified as elementary maintenance, including:
 - repair of non-structural fairings, cover plates and cowlings
 - stop drilling of cracks and bonding to acrylic or Perspex windscreens
 - minor repairs to fabric surfaces
 - restoration of preservative or protective materials

Removable components include:

- Those that are installed using bolts and/or screws. Where component removal and installation requires the removal and installation of rivets the applicable unit is MEA371 Perform major repairs and modifications to small aircraft structure

Components include:

- Removable components of wings, tail booms, pylons, empennage, skids, fairings and nacelles
- Removable components or sections of non-pressurised fuselages
- Non-pressurised fuselage entry, cargo, access doors and associated seals, including checking and adjustment of all doors and access panels and associated locking

- mechanisms
- Non-pressurised fuselage windows and transparent panels
- Floor panels
- Specialist advice is obtained from:**
 - Supervisors
 - Specialist structures personnel
- Maintenance documentation includes:**
 - Servicing schedules
 - Maintenance manuals
- Procedures and requirements include:**
 - Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

New unit of competency partially replacing MEA311D Inspect and repair/modify aircraft structures and also partially replacing MEA363B Inspect, repair and maintain structures and related components of non-pressurised small aircraft

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA369 Inspect and maintain structures and related components of non-pressurised small aircraft

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all relevant WHS procedures, including the selection and use of MSDS and applicable items of PPE
- demonstrating appropriate cleaning procedures to enable structure inspection
- demonstrating correct inspection procedures in accordance with aircraft and procedures manuals
- identifying damage to aircraft metallic (ferrous and non-ferrous) structures and/or components by way of impact, fatigue or the various types of corrosion
- inspecting damage and assessing composite components/structures
- identifying various aircraft metals and their basic properties
- identifying composite materials used in aircraft construction, associated safety precautions and hazards
- using appropriate hand tools and machines, including riveting equipment, drilling equipment, aligning tools and material fasteners (grip pins)
- applying correct removal, installation and repair techniques for a range of rivets (blind and solid) using hand, squeeze and pneumatic situations
- performing metal, composite and fabric repairs classified as elementary maintenance
- restoring aircraft structure sealing and surface finishes
- using relevant maintenance documentation and aircraft manuals to:
 - remove and install structural and non-structural components
 - remove and install aircraft interior fittings
 - remove and install doors, door seals, windows and transparent panels
 - checking and adjusting all doors and access panels, including locking mechanisms
- removing and installing emergency equipment.

It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure.

Evidence of transferability of skills and knowledge related to inspection, testing and minor repair of aircraft structure other than primary structure is essential. This may be demonstrated through application across a number of aircraft structures or aircraft types. Ability to interpret inspection and minor repair procedures and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- applicable WHS procedures, including the use of PPE and MSDS
- construction methods and materials used in:
 - fuselage sections
 - wing sections
 - engine nacelles and mounts
 - windows and window frames
 - doors, locks and access panels
- definition of structural terms, i.e. safe life, damage tolerant, failsafe, stress, strain, shear and cycles
- inspection requirements for metal and composite structure, including:
 - ageing aircraft inspection requirements
 - safe life structure
 - damage tolerant structure
 - fail safe structure
 - inspection following abnormal events
- potential causes of structural failure
- NDT methods and application of the various techniques
- construction methods of, and assessing common defects in, aircraft plastic transparencies
- basic constructional features of, and assessing common defects in, glass windscreens
- aircraft fabric coverings and methods for performance of minor repairs classified as elementary maintenance
- the various forms of structural corrosion, stating the causes and structural effects of corrosion on aircraft
- the terms associated with composite materials and types of composite materials
- non-structural component methods of attachment and faying surface treatment
- non-pressurised fuselage aircraft doors, related seals and window and transparent panel attachment methods and sealing
- aircraft interior fittings (trim, linings, seats and floor panels) construction and attachment methods
- the location and attachment or stowage methods for emergency equipment
- assessment of structural damage:
 - types and classes of mechanical damage
 - types of corrosion and determining the extent of damage
 - relevant documentation and manuals
 - damage limits and repair schemes for metallic and non-metallic structure
- how to perform minor repairs to metal and composite structure that are classified as elementary maintenance

- surface finishes and methods of restoration, including specific WHS and PPE requirements
- how to obtain MSDS
- relevant maintenance and structural repair manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision across the variables in the Range of Conditions as follows:
 - inspection and/or testing of at least one (1) item from each of the following groups:
 - non-ferrous and ferrous alloys and composite (FRP) materials used in aircraft construction
 - structural fastening and attachment hardware and/or devices
 - seals and sealants
 - glass and moulded plastics
 - preparation for application of NDT techniques
 - doors, hinges and locking mechanisms for damage/misalignment
 - inspections applicable to each of safe life, damage tolerant and fail safe structure relevant to enterprise
 - ageing aircraft inspection programs
 - inspection after abnormal events
 - recognition of each type of damage:
 - impact damage
 - fatigue cracking
 - corrosion
 - delamination of composites and bonded structures
 - one (1) minor elementary maintenance repair task from each of the following groups:
 - repair of non-structural fairings, cover plates and cowlings
 - stop drilling of cracks and bonding to acrylic or Perspex windscreens
 - restoration of preservative or protective materials
 - one (1) removal and installation task from each of the following groups:
 - removable components of wings, tail booms, pylons, empennage, skids, fairings and nacelles
 - removable components or sections of non-pressurised fuselages

- non-pressurised fuselage entry, cargo, access doors and associated seals (including checking and adjustment of all doors and access panels and associated locking mechanisms)
 - non-pressurised fuselage windows and transparent panels
 - floor panels.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
 - Assessors must satisfy National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) assessor requirements.
 - Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
 - The competency elements and performance criteria also cover some of those required for units MEA304 Remove and install non-pressurised aircraft structural and non-structural components and MEA339 Inspect, repair and maintain aircraft structures. Refer to those units for details of credits that may be granted during assessment of those units.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA370 Repair the structure of non-pressurised small aircraft

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of procedures and techniques associated with the repair of non-pressurised small aircraft structure during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team and involves the performance of a limited range of metal and composite repairs. Where extensive repair involving the replacement of major structural components, such as wing spars and fuselage frames, is required the applicable unit is MEA371 Perform major repairs and modifications to small aircraft metal structure.

The unit is part of the Aeroskills Mechatronics Certificates III and IV small aircraft maintenance training pathways.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA369 Inspect and maintain structures and related components of non-pressurised small aircraft

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|-----------------------------|-----|---|
| 1. | Prepare to undertake repair | 1.1 | Extent of damage is correctly assessed to assist in determining repair procedure |
| | | 1.2 | Appropriate repair scheme is identified in accordance with structural repair manual and/or approved data |
| | | 1.3 | Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage is out of limits |
| | | 1.4 | All materials and equipment required are organised |
| 2. | Repair aircraft structure | 2.1 | Structural repairs are performed in accordance with approved repair scheme ensuring that aircraft standard practices are used and process requirements are carried out while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 2.2 | Preventative maintenance techniques are employed to preserve the integrity of aircraft structure |
| | | 2.3 | Work area is cleaned of all waste material or contaminants |
| | | 2.4 | Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Damage or defects include:**
- Impact damage
 - Fatigue cracking
 - Corrosion

- Structural repairs include:**
- Delamination of composites and bonded structures
 - Removing corrosion by chemical and mechanical methods
 - Restoring protective coatings
 - Applying sealants and jointing compounds
 - Freehand precision hole generation
 - Removing and installing structural hardware and fastening devices
 - Removing and replacing bushes, bearings and bearing surfaces
 - Metal scab patch, flush, splice, lap and formed section repairs
 - Composite external patch, scarf, stepped and bolted repairs
- Specialist advice is obtained from:**
- Supervisors
 - Specialist structures personnel
- Maintenance documentation includes:**
- Servicing schedules
 - Maintenance manuals
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

New unit of competency partially replacing MEA363B Inspect, repair and maintain structures and related components of non-pressurised small aircraft

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA370 Repair the structure of non-pressurised small aircraft

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all relevant WHS procedures, including the selection and use of MSDS and applicable items of PPE
- identifying damage to aircraft metallic (ferrous and non-ferrous) structures and/or components by way of impact, fatigue or the various types of corrosion
- inspecting damage and assessing composite components/structures
- identifying various aircraft metals and their basic properties
- identifying composite materials used in aircraft construction, associated safety precautions and hazards
- correctly interpreting repair scheme drawings, including third angle projection, isometric, sectional formats and hand sketches
- using appropriate hand tools and machines, including riveting equipment, drilling equipment, aligning tools and material fasteners (grip pins)
- applying correct removal, installation and repair techniques for:
 - a range of rivets (blind and solid) using hand, squeeze and pneumatic situations
 - a range of close tolerance fasteners (standard and oversize – hillocks and taper locks), including hole preparation
 - threaded devices, including internal and external thread cutting, Helicoil inserts and damaged stud replacement
 - hardware assembled by close tolerance fits using heat, cooling and force methods, including bearings, bushes and inserts
- performing a range of metal structure and composite material repair techniques, including:
 - metal scab patch, flush, splice, lap and formed section repair
 - composite external patch, scarf, stepped and bolted repairs
 - metal to metal and metal to composite bonding
- applying structural corrosion removal/treatment techniques
- restoring aircraft structure sealing and surface finishes.

It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure.

Evidence of transferability of skills and knowledge related to inspection, testing and repair of aircraft structure is essential. This may be demonstrated through application across a number of aircraft structures or aircraft types. Ability to interpret inspection and repair procedures and specifications and apply them in practice is critical. The application of the procedures should also clearly indicate knowledge of structural flight loads and aerodynamic requirements.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- applicable WHS procedures, including the use of PPE and MSDS
- requirements for handling and storing aircraft metals and composite materials, including sealing agents, to industry standards
- means of identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour
- structural and non-structural component methods of attachment, faying surface treatment and fuel tank sealing
- assessment of structural damage:
 - types and classes of mechanical damage
 - types of corrosion and determining the extent of damage
 - relevant documentation and manuals
 - damage limits and repair schemes for metallic and non-metallic structure
- procedures for the fabrication and fitment of metal repairs:
 - scab patch
 - flush patch
 - splice
 - lap
 - formed section
- corrosion removal and passivation
- procedures for performing composite repairs:
 - external patch
 - scarf patch
 - stepped repairs
 - bolted repairs
- repair of integral fuel tanks and sealing of faying surfaces, including specific WHS and PPE requirements
- surface finishes and methods of restoration, including specific WHS and PPE requirements
- how to obtain MSDS
- relevant maintenance and structural repair manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision across the variables in the Range of Conditions as follows:
 - recognition of each type of damage:
 - impact damage
 - fatigue cracking
 - corrosion
 - delamination of composites and bonded structures
 - one (1) repair task from each of the following groups:
 - remove corrosion by chemical and mechanical methods
 - restore protective coatings
 - apply sealants and jointing compounds
 - freehand precision hole generation
 - remove and install structural hardware and fastening devices
 - remove and replace bushes, bearings and bearing surfaces
 - metal scab patch, flush, splice, lap and formed section repair
 - composite external patch, scarf and stepped repairs.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
- The competency elements and performance criteria also cover a significant portion of those required for unit MEA339 Inspect, repair and maintain aircraft structures. Refer to that unit for details of credits that may be granted during assessment.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA371 Perform major repairs and modifications to small aircraft metal structure

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, applicable tools, maintenance publications and repair drawings to perform major repairs and modifications to small aircraft structure, including the replacement of primary structure components of both fixed and rotary wing aircraft. This may occur during scheduled or unscheduled maintenance activities and may involve individual or team-related activities.

The unit is part of the Aeroskills Mechatronics Certificates III and IV small aircraft maintenance training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

- | | |
|--------|--|
| MEA369 | Inspect and maintain structures and related components of non-pressurised small aircraft |
| MEA370 | Repair the structure of non-pressurised small aircraft |

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Prepare to undertake repair or modification | 1.1 Modification or the repair scheme is identified in accordance with structural repair manual and/or approved data |
| | 1.2 Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or where damage is beyond specified limits |
| | 1.3 All materials and equipment required are organised |
| | 1.4 Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage |
| | 1.5 Jigs, fixtures or bracing are used, as required, to maintain shape and/or alignment |
| 2. Repair/modify aircraft structure | 2.1 Structural repairs/modifications are performed, in accordance with approved repair scheme or modification drawings and instructions, ensuring that aircraft standard practices are used and process requirements are carried out while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 2.2 Work area is cleaned of all waste material or contaminants |
| | 2.3 Required mensuration/alignment checks are completed and components are adjusted, where necessary, to operate within prescribed specifications |
| | 2.4 Repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures, where required |
| | 2.5 Required maintenance documentation is completed and processed in accordance with standard enterprise |

procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- | | |
|---|--|
| Repair tasks include: | <ul style="list-style-type: none">• Removing and installing structural hardware and fastening devices• Repairing by replacement major load-carrying structural members, such as skins, longerons, spars, frames and bulkheads |
| Assembly stress defects include: | <ul style="list-style-type: none">• Oil canning• Buckling• Contour misalignment |
| Procedures and requirements include: | <ul style="list-style-type: none">• Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise |

Unit Mapping Information

Release 1 – partially replaces MEA311D Inspect and repair/modify aircraft structures

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA371 Perform major repairs and modifications to small aircraft metal structure

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS regulations and practices, including the use of MSDS and PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying aircraft structural assembly fasteners by interpretation of markings, numbering systems, size, shape and colour
- correctly interpreting and/or producing repair scheme/modification drawings, including third angle projection, isometric, sectional formats and hand sketches
- using appropriate hand tools and machines to remove and assemble aircraft structural components, parts, sections and skin, including riveting equipment, drilling equipment, aligning tools and material fasteners (grip pins)
- applying correct removal, installation and repair techniques for:
 - a range of rivets (blind and solid) using hand, squeeze and pneumatic situations
 - a range of close tolerance fasteners (standard and oversize – hillocks and taper locks), including hole preparation
 - threaded devices, including internal and external thread cutting, Helicoil inserts and damaged stud replacement
 - hardware assembled by close tolerance fits using heat, cooling and force methods, including bearings, bushes and inserts
- correctly supporting the aircraft structure by jacking, trestling and/or jiggling methods
- performing mensuration checks after structure reassembly.

It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure.

Evidence of transferability of skills and knowledge related to the major repair and modification of aircraft structure is essential. This may be demonstrated through application across a number of aircraft systems or aircraft types. Ability to interpret repair/modification procedures and specifications and apply them in practice is critical. The application of the procedures should also clearly indicate knowledge of structural flight loads and aerodynamic requirements.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft construction principles and structural component attachment methods for primary structure:
 - fuselage
 - wings and attachment fittings
 - horizontal and vertical stabilisers and attachment fittings
 - pylons and attachment fittings
 - flight control surfaces
 - engine mounts and nacelles and attachment fittings
 - undercarriage attachments
- procedures for replacement of primary structure components, such as:
 - fuselage frames and longerons
 - wing spars or spar caps
 - wing-to-fuselage attachment fittings
 - tailplane attachment fittings
 - undercarriage attachment fittings
- aircraft mensuration checks – when required and methodology
- repair of integral fuel tanks and sealing of faying surfaces, including specific WHS and PPE requirements
- surface finishes and methods of restoration
- how to obtain MSDS
- relevant maintenance and structural repair manuals and modification data
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on tasks involving repairing by replacement or modifying major load-carrying structural members, such as skins, longerons, spars, frames and bulkheads.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA372 Perform mechanical elementary maintenance

Modification History

Release 2 - Additional items added to Range of Conditions to align with CASR Part 66 MOS and related changes made to Assessment Requirements

Application

The unit of competency provides skills and knowledge required by small aircraft maintenance B1 and B2 Licence holders to perform and certify mechanical elementary maintenance on small fixed and rotary wing aircraft.

The unit is part of the Aeroskills Mechatronics Certificates IV small aircraft maintenance training pathways.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA301 Perform aircraft flight servicing

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes

Performance criteria describe the performance needed to demonstrate achievement of the element

- | | |
|---------------------------------|--|
| 1. Remove mechanical components | 1.1 System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted, where necessary, to ensure personnel safety |
|---------------------------------|--|

- 1.2 Removal of components is carried out in accordance with approved maintenance data while observing all relevant work health and safety (WHS) procedures including the use of material safety data sheets (MSDS) and personal protective equipment (PPE)
- 1.3 Required maintenance documentation is accurately compiled and correctly processed
- 1.4 Removed components are tagged, sealed and packaged in accordance with specified procedures
2. Install mechanical components
 - 2.1 Components to be installed are checked to confirm correct part numbers, serviceability and modification status
 - 2.2 Installation is carried out in accordance with approved maintenance data while observing all relevant WHS procedures, including the use of MSDS and PPE
 - 2.3 Required maintenance documentation is accurately completed and correctly processed
3. Repair mechanical non-structural components
 - 3.1 Extent of damage is correctly assessed to assist in determining repair procedure
 - 3.2 Appropriate repair scheme is identified in accordance with structural repair manual and/or approved data
 - 3.3 All required materials and equipment are organised
 - 3.4 Repairs are performed in accordance with approved repair scheme, ensuring that aircraft standard practices are used and process requirements are carried out while observing all relevant WHS procedures, including the use of MSDS and PPE
 - 3.5 Work area is cleaned of all waste material or contaminants
 - 3.6 Required maintenance documentation is accurately completed and correctly processed

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Mechanical elementary maintenance tasks include:

- Replacement of defective locking wire or split pins used on other than flight control systems
- Removal and installation of passenger and crew seat safety restraints
- Removal and installation of co-pilot control levers
- Removal and installation of simple hose connections not requiring special tools or bench assembly (excludes hydraulic connections and engine compartment fuel and oil pressure or scavenge hose connections)
- Removal and installation of prefabricated fuel lines
- Removal and installation of aircraft wheels or skids, including servicing and inspection of wheel bearings and replacement of tyres
- Removal and installation of landing gear elastic shock absorber cords
- Removal and installation of engine cowls not requiring propeller removal or disconnection of engine controls
- Removal and installation of induction system baffles
- Removal and installation of non-structural passenger cabin partitions
- Replacement of side windows in non-pressurised cabins
- Removal and installation of spark plugs, includes cleaning and setting of gap clearance
- Performance of cylinder compression tests
- Removal and installation of fuel and oil strainers or filter elements, includes element disassembly and cleaning, where applicable
- Removal, checking and installation of magnetic chip detectors
- Removal and installation of doors on non-pressurised aircraft
- Small simple repairs to fairings, non-structural cover plates and cowlings
- Simple fabric patches not requiring rib stitching or the

removal of structural components (not on flight controls)

- Minor repairs to cabin trim and upholstery
- Restoration of finish after repairs and minor touch-up of decorative coatings
- Adding oil, air or both to non-retractable landing gear shock struts
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 2 - Additional items added to Range of Conditions to align with CASR Part 66 MOS and related changes made to Assessment Requirements. Equivalent.

Release 1 - New unit

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA372 Perform mechanical elementary maintenance

Modification History

Release 2 - Additional items added to Range of Conditions to align with CASR Part 66 MOS and related changes made to Assessment Requirements

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all relevant WHS procedures, including the selection and use of MSDS and applicable items of PPE
- correctly removing and installing mechanical components listed in the Range of Conditions
- performing repairs listed in the Range of Conditions and classified as elementary maintenance
- removing and installing removable items of cabin and cockpit equipment including co-pilot control levers
- removing, checking and reinstalling engine chip detectors.
- performance of engine compression tests

The underlying skills inherent in this unit should be transferable across a range of elementary maintenance and repair applications across the aircraft types maintained by the enterprise. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- applicable WHS procedures, including the use of PPE and MSDS
- aircraft configuration and safety precautions associated with component removal and installation tasks listed in the Range of Conditions
- types of aircraft fabric coverings and the procedures for minor repairs classified as elementary maintenance
- aircraft composite materials and associated safety precautions
- aircraft window materials and construction
- methods of minor composite repairs classified as elementary maintenance

- methods for performing minor repairs to cabin trim and upholstery
- purpose of chip detectors and inspection requirements
- procedure for performing engine compression tests

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of CASA and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the following mechanical elementary maintenance tasks:
 - replacement of defective locking wire or split pins used on other than flight control systems
 - removal and installation of passenger and crew seat safety restraints
 - removal and installation of co-pilot control levers
 - removal and installation of simple hose connections not requiring special tools or bench assembly (excludes hydraulic connections and engine compartment fuel and oil pressure or scavenge hose connections)
 - removal and installation of prefabricated fuel lines
 - removal and installation of aircraft wheels or skids, including servicing and inspection of wheel bearings and replacement of tyres
 - removal and installation of landing gear elastic shock absorber cords
 - removal and installation of engine cowls not requiring propeller removal or disconnection of engine controls
 - removal and installation of induction system baffles
 - removal and installation of non-structural passenger cabin partitions
 - replacement of side windows in non-pressurised cabins
 - removal and installation of spark plugs, includes cleaning and setting of gap clearance
 - performance of cylinder compression tests
 - removal and installation of fuel and oil strainers or filter elements, includes element disassembly and cleaning, where applicable
 - removal, checking and installation of magnetic chip detectors
 - removal and installation of doors on non-pressurised aircraft
 - small simple repairs to fairings, non-structural cover plates and cowlings
 - simple fabric patches not requiring rib stitching or the removal of structural components (not on flight controls)
 - minor repairs to cabin trim and upholstery
 - restoration of finish after repairs and minor touch-up of decorative coatings

- adding oil, air or both to non-retractable landing gear shock struts.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A380 Repair and/or overhaul aircraft hydraulic system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul hydraulic system components from fixed and rotary wing aircraft in workshops during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Determine requirements | 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 Hydraulic components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. Troubleshoot hydraulic components | 2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | 2.2 Logical processes are used to ensure efficient and accurate troubleshooting |
| | 2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |
| | 2.4 Hydraulic component faults are located and the causes of the faults are clearly identified |
| | 2.5 Fault rectification requirements are determined to assist in planning the repair |
| 3. Dismantle and inspect hydraulic component parts | 3.1 Hydraulic component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |

- | | | | |
|----|--|--|--|
| | 3.3 | Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures | |
| | 3.4 | Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation | |
| | 3.5 | Parts lists are compiled and processed in accordance with standard enterprise procedures | |
| 4. | Repair and/or modify hydraulic components or parts | 4.1 | Component parts are repaired or replaced in accordance with the relevant maintenance documentation |
| | | 4.2 | Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures |
| 5. | Assemble, test and adjust hydraulic components | 5.1 | Hydraulic component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 5.2 | Components are adjusted, tested or calibrated to operate within prescribed specifications |
| | | 5.3 | Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures |
| | | 5.4 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Hydraulic components include:

- Valves, pumps, motors, actuators, regulators, struts/oleos and brake units
- Accumulators, filters and reservoirs
- Rigid and flexible pipelines, hoses and fittings

Repair of component parts include:

- Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
- Removal of corrosion within maintenance manual limits
- Replacement of seals and backing rings
- Replacement of bearings
- Application of surface treatments, such as alodining
- Restoration of paint finishes

Testing and adjustment includes:

- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA380A Repair and/or overhaul aircraft hydraulic system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA380 Repair and/or overhaul aircraft hydraulic system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using MSDS and applicable items of PPE
- using relevant maintenance documentation and aircraft/component manuals relating to hydraulic system components to:
 - recognise state of serviceability and overhaul or repair requirements
 - test and accurately and efficiently troubleshoot unserviceabilities and document the causes
 - dismantle and inspect component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify component parts
 - assemble, test for correct operation and adjust components.

The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with aircraft components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence.

Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the correct use of PPE
- WHS procedures

- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes
- hydraulic test rigs and their operation
- compressed air and nitrogen charging equipment.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) component from each of the following groups:
 - valves, pumps, motors, actuators, regulators, struts/oleos and brake units
 - accumulators, filters and reservoirs
 - rigid and flexible pipelines, hoses and fittings.
- This must include demonstration of the following repair processes:
 - finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
 - removal of corrosion within maintenance manual limits
 - replacement of seals and backing rings
 - replacement of bearings
 - application of surface treatments, such as alodining
 - restoration of paint finishes.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A381 Repair and/or overhaul aircraft pneumatic system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul pneumatic system components from fixed and rotary wing aircraft in workshops during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Determine requirements | 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 Pneumatic components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. Troubleshoot pneumatic components | 2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | 2.2 Logical processes are used to ensure efficient and accurate troubleshooting |
| | 2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |
| | 2.4 Pneumatic component faults are located and the causes of the faults are clearly identified |
| | 2.5 Fault rectification requirements are determined to assist in planning the repair |
| 3. Dismantle and inspect pneumatic parts | 3.1 Pneumatic component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |

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| | | 3.3 | Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures |
| | | 3.4 | Parts requiring non-destructive testing (NDT) are prepared for testing in accordance with the relevant maintenance documentation |
| | | 3.5 | Parts lists are compiled and processed in accordance with standard enterprise procedures |
| 4. | Repair and/or modify pneumatic components or parts | 4.1 | Component parts are repaired or replaced in accordance with the relevant maintenance documentation |
| | | 4.2 | Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures |
| 5. | Assemble, test and adjust pneumatic components | 5.1 | Pneumatic component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 5.2 | Components are adjusted, tested or calibrated to operate within prescribed specifications |
| | | 5.3 | Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures |
| | | 5.4 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Pneumatic components from pressurisation, air cycle air conditioning and pneumatic systems include:

- Valves, pumps, motors, expansion turbines, actuators, regulators, temperature sensors, mechanical pressurisation controllers, temperature controllers and thrust reversers

Repair of component parts includes:

- Heat exchangers and pressure vessels
- Rigid and flexible pipelines, hoses, fittings and ducting
- Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
- Removal of corrosion within maintenance manual limits
- Replacement of seals and backing rings
- Replacement of bearings
- Application of surface treatments, such as alodining
- Restoration of paint finishes

Testing and adjustment:

- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA381A Repair and/or overhaul aircraft pneumatic system components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA381 Repair and/or overhaul aircraft pneumatic system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using MSDS and relevant items of PPE
- using relevant maintenance documentation and aircraft/component manuals relating to pneumatic, pressurisation and air cycle air conditioning system components to:
 - recognise state of serviceability and overhaul or repair requirements
 - test and accurately and efficiently troubleshoot unserviceabilities and document the causes
 - dismantle and inspect component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify component parts
 - assemble, test for correct operation and adjust components.

The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with aircraft components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- identification and use of items of PPE
- WHS procedures
- fault diagnosis techniques
- system and component operation

- repair and overhaul procedures and processes
- the use of pneumatic test rigs.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before under taking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) component from each of the following groups:
 - valves, pumps, motors, expansion turbines, actuators, regulators, temperature sensors, mechanical pressurisation controllers, temperature controllers and thrust reversers
 - heat exchangers and pressure vessels
 - rigid and flexible pipelines, hoses, fittings and ducting.
- This must include demonstration of the following repair processes:
 - finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
 - removal of corrosion within maintenance manual limits
 - replacement of seals and backing rings
 - replacement of bearings
 - application of surface treatments, such as alodining
 - restoration of paint finishes.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA382 Repair and/or overhaul aircraft fuel system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul fuel system components from fixed and rotary wing aircraft in workshops during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. Determine requirements | 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 Fuel system components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. Troubleshoot fuel system components | 2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | 2.2 Logical processes are used to ensure efficient and accurate troubleshooting |
| | 2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |
| | 2.4 Fuel system component faults are located and the causes of the faults are clearly identified |
| | 2.5 Fault rectification requirements are determined to assist in planning the repair |
| 3. Dismantle and inspect fuel system component parts | 3.1 Fuel system component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |

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| | 3.3 | Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures |
| | 3.4 | Parts requiring non-destructive testing (NDT) are prepared for testing in accordance with the relevant maintenance documentation |
| | 3.5 | Parts lists are compiled and processed in accordance with standard enterprise procedures |
| 4. Repair and/or modify fuel system components or parts | 4.1 | Component parts are repaired or replaced in accordance with the relevant maintenance documentation |
| | 4.2 | Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures |
| 5. Assemble, test and adjust fuel system components | 5.1 | Fuel system component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 5.2 | Components are adjusted, tested or calibrated to operate within prescribed specifications |
| | 5.3 | Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures |
| | 5.4 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Fuel system components include:

- Valves, pumps and control units
- Filters, rigid and flexible pipelines, hoses, fittings and flexible fuel tanks

Repair of component parts includes:

- Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
- Removal of corrosion within maintenance manual limits
- Replacement of seals and backing rings
- Replacement of bearings
- Application of surface treatments, such as alodining
- Restoration of paint finishes
- Repair of flexible fuel tank leaks

Testing and adjustment:

- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA382A Repair and/or overhaul aircraft fuel system components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA382 Repair and/or overhaul aircraft fuel system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using MSDS and applicable items of PPE
- using relevant maintenance documentation and aircraft/component manuals relating to fuel system components to:
 - recognise state of serviceability and overhaul or repair requirements
 - test and accurately and efficiently troubleshoot unserviceabilities and document the causes
 - dismantle and inspect component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify component parts
 - assemble, test for correct operation and adjust components.

The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with aircraft components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes

- the use of fuel system test rigs.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) component from each of the following groups:
 - valves, pumps and control units
 - filters, rigid and flexible pipelines, hoses, fittings and flexible fuel tanks.
- This must include demonstration of the following repair processes:
 - finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
 - removal of corrosion within maintenance manual limits
 - replacement of seals and backing rings
 - replacement of bearings
 - application of surface treatments, such as alodining
 - restoration of paint finishes.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA383 Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft gas turbine air inlet and compressor components in workshops during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include air inlet and compressor components from turbo-jet, turbofan, turboshaft, turboprop engines and engine modules, or auxiliary power units.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. | Determine requirements | 1.1 | Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | | 1.2 | Air inlet and compressor components are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary |
| | | 1.3 | Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | | 1.4 | Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. | Troubleshoot air inlet and compressor components | 2.1 | Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | | 2.2 | Logical processes are used to ensure efficient and accurate troubleshooting |
| | | 2.3 | Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |
| | | 2.4 | Air inlet and compressor component faults are located and the causes of the faults are clearly identified |
| | | 2.5 | Fault rectification requirements are determined to assist in planning the repair |
| 3. | Dismantle and inspect air inlet and compressor parts | 3.1 | Air inlet and compressor component parts are dismantled in accordance with maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 3.2 | Component parts are assessed for serviceability in |

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- accordance with the relevant maintenance documentation
- 3.3 Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
 - 3.4 Parts requiring non-destructive testing (NDT) are prepared for testing in accordance with the relevant maintenance documentation
 - 3.5 Parts lists are compiled and processed in accordance with standard enterprise procedures
- 4. Repair and/or modify air inlet and compressor components or parts
 - 4.1 Component parts are repaired or replaced in accordance with the relevant maintenance documentation
 - 4.2 Modification of components is undertaken, where required, by reference to relevant manufacturers' bulletins or procedures and/or customer requirements
- 5. Assemble and adjust air inlet and compressor components
 - 5.1 Air inlet and compressor component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 5.2 Support/safety equipment, where fitted, is removed at the appropriate time
 - 5.3 Components are adjusted to ensure that fits and clearances are within prescribed specifications
 - 5.4 Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Air inlet and compressor components include:

- Air inlet structure and blow-in doors where these items are part of an engine change unit or engine module
- Fans (where applicable to the enterprise)
- Inlet guide vanes
- Centrifugal or axial flow compressor assemblies (low and high pressure)
- Compressor bleed valves (where applicable to the enterprise)

Repair of component parts includes:

- Finishing or re-finishing of metal surfaces through processes, such as polishing, lapping and blending of damage within maintenance manual limits
- Removal of corrosion within maintenance manual limits
- Replacement of seals and gaskets
- Replacement of bearings
- Application of surface treatments, such as alodining
- Restoration of paint finishes

Testing and adjustment:

- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA383A Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA383 Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and overhaul or repair requirements for air inlet and compressor components
 - test and accurately and efficiently troubleshoot unserviceabilities and document the causes in air inlet and compressor components
 - dismantle and inspect air inlet and compressor component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify air inlet and compressor component parts
 - assemble and adjust air inlet and compressor components
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with gas turbine engine components and/or modules. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different gas turbine engine components and/or modules. Ability to assess component/module serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE

- WHS procedures
- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes, including inspection, rework, repair and reclamation, assembly, balancing of rotating assemblies and final adjustment.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - air inlet structure and blow-in doors where these items are part of an engine change unit or engine module
 - fans, where applicable (may be omitted if not applicable to the enterprise)
 - inlet guide vanes
 - centrifugal or axial flow compressor assemblies (low and high pressure)
 - compressor bleed valves, where applicable (may be omitted if not applicable to the enterprise).
- This must include demonstration of the following repair processes:
 - finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
 - removal of corrosion within maintenance manual limits
 - replacement of seals and backing rings
 - replacement of bearings
 - application of surface treatments, such as alodining
 - restoration of paint finishes.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA384 Repair and/or overhaul gas turbine engine combustion section components and/or modules

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft gas turbine engine or engine module combustion section components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include combustion section components and modules from turbo-jet, turbofan, turboshaft, turboprop engines, engine modules or auxiliary power units.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. Determine requirements | 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 Combustion section components are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. Troubleshoot combustion section components | 2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | 2.2 Logical processes are used to ensure efficient and accurate troubleshooting |
| | 2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |
| | 2.4 Combustion section component faults are located and the causes of the faults are clearly identified |
| | 2.5 Fault rectification requirements are determined to assist in planning the repair |
| 3. Dismantle and inspect combustion section component parts | 3.1 Combustion section component parts are dismantled in accordance with maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 3.2 Component parts are assessed for serviceability in |

- accordance with the relevant maintenance documentation
- 3.3 Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
- 3.4 Parts requiring non-destructive testing (NDT) are prepared for testing in accordance with the relevant maintenance documentation
- 3.5 Parts lists are compiled and processed in accordance with standard enterprise procedures
- 4. Repair and/or modify combustion section components or parts
 - 4.1 Component parts are repaired or replaced in accordance with the relevant maintenance documentation
 - 4.2 Modification of components is undertaken, where required, by reference to relevant manufacturers' bulletins or procedures and/or customer requirements
- 5. Assemble and adjust combustion section components
 - 5.1 Combustion section component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 5.2 Support/safety equipment, where fitted, is removed at the appropriate time
 - 5.3 Components are adjusted to ensure that fits and clearances are within prescribed specifications
 - 5.4 Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
 - 5.5 Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

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| Combustion section components and/or modules include: | <ul style="list-style-type: none">• Fuel manifold and nozzles• Combustion chamber (multiple can, can-annular or annular) |
| Repair of component parts include: | <ul style="list-style-type: none">• Finishing or re-finishing of metal surfaces through processes such as polishing and lapping• Removal of corrosion within maintenance manual limits• Replacement of seals and gaskets |
| Testing and adjustment: | <ul style="list-style-type: none">• Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level |
| Procedures and requirements include: | <ul style="list-style-type: none">• Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise |

Unit Mapping Information

Release 1 – equivalent to MEA384A Repair and/or overhaul gas turbine engine combustion section components and/or modules

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA384 Repair and/or overhaul gas turbine engine combustion section components and/or modules

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and overhaul or repair requirements for combustion section components
 - test and accurately and efficiently troubleshoot engine combustion component unserviceabilities and document the causes
 - dismantle and inspect combustion section component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify combustion section component parts
 - assemble and adjust combustion section components
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with gas turbine engine components and/or modules. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different gas turbine engine components and/or modules. Ability to assess component/module serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE

- WHS procedures
- fault diagnosis techniques
- combustion section and component operation
- repair and overhaul procedures and processes, including inspection, rework, repair and reclamation, assembly, testing and final adjustment.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before under taking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - fuel manifold and nozzles
 - combustion chamber (multiple can, can-annular or annular).
- This must include demonstration of the following repair processes:
 - finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
 - removal of corrosion within maintenance manual limits
 - replacement of seals and gaskets.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA385 Repair and/or overhaul gas turbine engine turbine and exhaust section components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft gas turbine engine turbine and exhaust section components in workshops during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include turbine and exhaust section components from turbo-jet, turbofan, turboshaft, turboprop engines and engine modules, or auxiliary power units.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Determine requirements | 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 Turbine and exhaust section components are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. Troubleshoot turbine and exhaust section components | 2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | 2.2 Logical processes are used to ensure efficient and accurate troubleshooting |
| | 2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |
| | 2.4 Turbine and exhaust section component faults are located and the causes of the faults are clearly identified |
| | 2.5 Fault rectification requirements are determined to assist in planning the repair |
| 3. Dismantle and inspect turbine and exhaust section component parts | 3.1 Turbine and exhaust section component parts are dismantled in accordance with maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |

- 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
 - 3.3 Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
 - 3.4 Parts requiring non-destructive testing are prepared for testing in accordance with the relevant maintenance documentation
 - 3.5 Parts lists are compiled and processed in accordance with standard enterprise procedures
- 4. Repair and/or modify turbine and exhaust section components or parts
 - 4.1 Component parts are repaired or replaced in accordance with the relevant maintenance documentation
 - 4.2 Modification of components is undertaken, where required, by reference to relevant manufacturers' bulletins or procedures and/or customer requirements
- 5. Assemble and adjust turbine and exhaust section components
 - 5.1 Turbine and exhaust section component parts are balanced where required and assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 5.2 Support/safety equipment, where fitted, is removed at the appropriate time
 - 5.3 Components are adjusted to ensure that fits and clearances are within prescribed specifications
 - 5.4 Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
 - 5.5 Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Turbine and exhaust section components include:**
- High and low pressure turbine assemblies
 - Free turbine (where applicable to the enterprise)
 - Automatic turbine rotor clearance control system (where applicable to the enterprise)
 - Engine tail cone and exhaust struts
 - Jet pipe that is part of the engine change unit or module
 - Thrust reversers (where applicable to the enterprise)
 - Afterburner system where it is part of the engine change unit or module (where applicable to the enterprise)
- Repair of component parts include:**
- Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
 - Removal of corrosion within maintenance manual limits
 - Replacement of seals and gaskets
 - Replacement of bearings
- Testing and adjustment:**
- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA385A Repair and/or overhaul gas turbine engine turbine and exhaust section components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA385 Repair and/or overhaul gas turbine engine turbine and exhaust section components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and overhaul or repair requirements for turbine and exhaust section components
 - test and accurately and efficiently troubleshoot turbine and exhaust section component unserviceabilities and document the causes
 - dismantle and inspect turbine and exhaust section component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify turbine and exhaust section component parts
 - assemble and adjust turbine and exhaust section components
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with gas turbine engine components and/or modules. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different gas turbine engine components and/or modules. Ability to assess component/module serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures

- fault diagnosis techniques
- turbine and exhaust section and component operation
- repair and overhaul procedures and processes, including inspection, rework, repair and reclamation, assembly, balancing of rotating assemblies and final adjustment.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - high and low pressure turbine assemblies
 - free turbine (may be omitted where not applicable to the enterprise)
 - automatic turbine rotor clearance control system (may be omitted where not applicable to the enterprise)
 - engine tail cone and exhaust struts
 - jet pipe that is part of the engine change unit or module
 - thrust reversers (may be omitted where not applicable to the enterprise)
 - afterburner system where it is part of the engine change unit or module (may be omitted where not applicable to the enterprise).
- This must include demonstration of the following repair processes:
 - finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
 - removal of corrosion within maintenance manual limits
 - replacement of seals and gaskets
 - replacement of bearings.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA386 Repair and/or overhaul gas turbine engine ancillary section components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft gas turbine engine ancillary section components in workshops during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include ancillary section components from turbo-jet, turbofan, turboshaft, turboprop engines and engine modules, or auxiliary power units.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Determine requirements	<p>1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers</p> <p>1.2 Ancillary section components are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary</p> <p>1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components</p> <p>1.4 Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures</p>
2. Troubleshoot ancillary section components	<p>2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination</p> <p>2.2 Logical processes are used to ensure efficient and accurate troubleshooting</p> <p>2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement</p> <p>2.4 Ancillary section component/module faults are located and the causes of the faults are clearly identified</p> <p>2.5 Fault rectification requirements are determined to assist in planning the repair</p>
3. Dismantle and inspect ancillary section component parts	<p>3.1 Ancillary section component parts are dismantled in accordance with maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)</p> <p>3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation</p> <p>3.3 Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard</p>

- enterprise procedures
- 3.4 Parts requiring non-destructive testing (NDT) are prepared for testing in accordance with the relevant maintenance documentation
- 3.5 Parts lists are compiled and processed in accordance with standard enterprise procedures
- 4. Repair and/or modify ancillary section components or parts
 - 4.1 Component parts are repaired or replaced in accordance with the relevant maintenance documentation
 - 4.2 Modification of components is undertaken, where required, by reference to relevant manufacturers' bulletins or procedures and/or customer requirements
- 5. Assemble and adjust ancillary section components
 - 5.1 Ancillary section component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 5.2 Support/safety equipment, where fitted, is removed at the appropriate time
 - 5.3 Components are adjusted to ensure that fits and clearances are within prescribed specifications
 - 5.4 Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
 - 5.5 Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Ancillary section components include:

- Accessory (or high-speed) gearbox
- Turboprop reduction gearbox (where applicable to the enterprise)
- Turboshaft drive shaft or reduction gearbox (where applicable to the enterprise)

Repair of component parts includes:

- Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
- Replacement of seals and gaskets
- Replacement of bearings
- Application of surface treatments
- Restoration of paint finishes

Testing and adjustment:

- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA386A Repair and/or overhaul gas turbine engine ancillary section components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA386 Repair and/or overhaul gas turbine engine ancillary section components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using relevant MSDS and items of PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and overhaul or repair requirements for ancillary section components
 - test and accurately and efficiently troubleshoot ancillary section component unserviceabilities and document the causes
 - dismantle and inspect ancillary section component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify ancillary section component parts
 - assemble and adjust ancillary section components
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with gas turbine engine components and/or modules. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different gas turbine engine components and/or modules. Ability to assess component/module serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE

- WHS procedures
- fault diagnosis techniques
- ancillary section and component operation
- repair and overhaul procedures and processes, including inspection, rework, repair and reclamation, assembly and final adjustment.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - accessory (or high-speed) gearbox
 - turboprop reduction gearbox (may be omitted if not applicable to the enterprise)
 - turboshaft drive shaft or reduction gearbox (may be omitted if not applicable to the enterprise).
- This must include demonstration of the following repair processes:
 - finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
 - replacement of seals and gaskets
 - replacement of bearings
 - application of surface treatments
 - restoration of paint finishes.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A387 Test gas turbine engines and engine modules after overhaul or repair

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to test run aircraft gas turbine engines and engine modules in engine test stands following overhaul or repair in workshops during the performance of scheduled or unscheduled maintenance. Testing may be performed individually or as part of a team.

Applications include turbo-jet, turbofan, turboshaft, turboprop engines and engine modules, or auxiliary power units.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A383	Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules
ME A384	Repair and/or overhaul gas turbine engine combustion section components and/or modules
ME A385	Repair and/or overhaul gas turbine engine turbine and exhaust section components
ME A386	Repair and/or overhaul gas turbine engine ancillary section components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|----|---|-----|--|
| 1. | Prepare engine or module for testing | 1.1 | Maintenance documentation is checked to confirm that engine or module is ready for testing |
| | | 1.2 | Where required, engine modules are assembled into a test engine |
| | | 1.3 | Engine is configured for testing in accordance with maintenance manual requirements and standard enterprise procedures |
| 2. | Install engine in test stand | 2.1 | Engine is installed in test stand in accordance with maintenance manual requirements and standard enterprise procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 2.2 | Fuel, oil and fluid levels are checked |
| | | 2.3 | Engine test stand is prepared for operation |
| 3. | Run and test engine or module performance | 3.1 | Engine is started and operating parameters are checked |
| | | 3.2 | Engine performance is tested and trimmed, where applicable, in accordance with maintenance manual requirements and standard enterprise procedures |
| | | 3.3 | Engine operating parameters and test results are recorded in accordance with standard enterprise procedures |
| 4. | Remove engine from test stand | 4.1 | Engine is removed from test stand in accordance with maintenance manual requirements and standard enterprise procedures while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 4.2 | Serviceable engines or modules are configured, inhibited and prepared in accordance with maintenance manual requirements and standard enterprise procedures for transport or storage |

- 4.3 Unserviceable engines or modules are returned to workshop in accordance with standard enterprise procedures for rectification or rework

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- | | |
|---|---|
| Engines include: | <ul style="list-style-type: none">• Fixed or rotary wing gas turbine engine (turbo-jet, turbofan, turboshaft, turboprop), or auxiliary power unit |
| Modules include: | <ul style="list-style-type: none">• Various combinations of gas turbine engine sections as determined by the manufacturer |
| Adjustment and testing includes: | <ul style="list-style-type: none">• Complex adjusting and testing of engine performance to be carried out under supervision |
| Procedures and requirements include: | <ul style="list-style-type: none">• Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise |

Unit Mapping Information

Release 1 – equivalent to MEA387A Test gas turbine engines and engine modules after overhaul or repair

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA387 Test gas turbine engines and engine modules after overhaul or repair

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using relevant MSDS and items of PPE
- using relevant maintenance manuals and standard enterprise procedures to:
 - prepare engines or modules for test running
 - install engines in test stands
 - test run and trim engines, where applicable
 - record engine operating parameters
 - remove engines from the test stand
 - complete documentation
- configuring and inhibiting serviceable engines and modules for transport or storage.

The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with gas turbine engines and/or modules. It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of gas turbine engine and/or module test runs. Capability to interpret test procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- test stand operation
- engine and module test requirements
- engine operating parameters and adjustment methods.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment in an applicable engine test stand. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot engine or module faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a range of engine/module test runs that are representative of the testing performed within the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA389 Repair and/or overhaul propellers

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft propellers and components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include piston and turbine engine propellers and components, excluding propeller blades that are made from materials other than metal.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|--|---|
| 1. Determine requirements | <ul style="list-style-type: none"> 1.1 Propellers and component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers 1.2 Components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components 1.4 Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. Troubleshoot propeller components | <ul style="list-style-type: none"> 2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination 2.2 Logical processes are used to ensure efficient and accurate troubleshooting 2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement 2.4 Propeller component faults are located and the causes of the faults are clearly identified 2.5 Fault rectification requirements are determined to assist in planning the repair |
| 3. Dismantle and inspect propeller parts | <ul style="list-style-type: none"> 3.1 Propeller component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |

- | | | | |
|----|--|--|--|
| | 3.3 | Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures | |
| | 3.4 | Parts requiring non-destructive testing (NDT) are prepared for testing in accordance with the relevant maintenance documentation | |
| | 3.5 | Parts lists are compiled and processed in accordance with standard enterprise procedures | |
| 4. | Repair and/or modify propeller components or parts | 4.1 | Component parts are repaired or replaced in accordance with the relevant maintenance documentation |
| | | 4.2 | Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures |
| 5. | Assemble, test and adjust propeller components | 5.1 | Component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 5.2 | Propeller components are adjusted, tested or calibrated to operate within prescribed specifications |
| | | 5.3 | Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures |
| | | 5.4 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Propellers and components include:**
- Fixed pitch, constant speed, feathering and reversing propellers and spinners
 - Anti ice/de-ice equipment
 - Propeller blades – metal
 - Hardware
- Repair of component parts includes:**
- Finishing or re-finishing of metal surfaces through processes, such as polishing, lapping and blending of damage within maintenance manual limits
 - Removal of corrosion within maintenance manual limits
 - Replacement of seals and gaskets
 - Replacement of bearings
 - Application of surface treatments, such as alodining
 - Restoration of paint finishes
- Power plant relationship:**
- The repair and/or overhaul of propeller and components may, in the case of turboprops and some full authority digital engine control (FADEC) systems, be related to aircraft power plant control systems
- Testing and adjustment:**
- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA389A Repair and/or overhaul propellers

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA389 Repair and/or overhaul propellers

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and overhaul or repair requirements for propellers and propeller components as listed in the Range of Conditions
 - test and accurately and efficiently troubleshoot unserviceabilities and document the causes with regard to propeller components
 - dismantle and inspect propeller component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify propeller component parts
 - assemble, balance, test for correct operation and adjust propeller components and propellers
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with aircraft components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different propeller components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures

- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. Knowledge of propeller, engine and constant speed unit operation, individually and as a system, will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - fixed pitch, constant speed, feathering and reversing propellers and spinners
 - anti-ice/de-ice equipment
 - propeller blades – metal
 - hardware.
- This must include demonstration of the following repair processes:
 - finishing or re-finishing of metal surfaces through processes, such as polishing, lapping and blending of damage within maintenance manual limits
 - removal of corrosion within maintenance manual limits
 - replacement of gaskets, seals and backing rings
 - replacement of bearings
 - application of surface treatments, such as alodining
 - restoration of paint finishes.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA390 Repair and/or overhaul rotary wing dynamic components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul rotary wing dynamic components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include rotor assemblies and components, transmissions, drive shafts and couplings from piston and turbine engine rotary wing aircraft.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Determine requirements | 1.1 | Rotary wing component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | | 1.2 | Components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required |
| | | 1.3 | Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | | 1.4 | Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. | Troubleshoot rotary wing comp | 2.1 | Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | | 2.2 | Logical processes are used to ensure efficient and accurate troubleshooting |
| | | 2.3 | Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |
| | | 2.4 | Rotary wing component faults are located and the causes of the faults are clearly identified |
| | | 2.5 | Fault rectification requirements are determined to assist in planning the repair |
| 3. | Dismantle and inspect rotary wing component parts | 3.1 | Rotary wing component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |

- 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation
- 3.3 Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
- 3.4 Parts requiring non-destructive testing (NDT) are prepared for testing in accordance with the relevant maintenance documentation
- 3.5 Parts lists are compiled and processed in accordance with standard enterprise procedures
- 4. Repair and/or modify rotary wing components or parts
 - 4.1 Rotary wing component parts are repaired or replaced in accordance with the relevant maintenance documentation
 - 4.2 Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures
- 5. Assemble, test and adjust rotary wing components
 - 5.1 Component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 5.2 Rotary wing components are adjusted, tested or calibrated to operate within prescribed specifications
 - 5.3 Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
 - 5.4 Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Rotary wing components include:**
- Rotor blades
 - Rotor heads, hinge assemblies and swashplates
 - Transmission gear boxes, drive shafts and couplings
- Repair of component parts includes:**
- Finishing or re-finishing of metal surfaces through processes, such as polishing, lapping and blending of damage within maintenance manual limits
 - Removal of corrosion within maintenance manual limits
 - Replacement of seals and gaskets
 - Replacement of bearings
 - Application of surface treatments, such as alodining
 - Restoration of paint finishes
- Testing and adjustment:**
- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA390A Repair and/or overhaul rotary wing dynamic components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA390 Repair and/or overhaul rotary wing dynamic components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and overhaul or repair requirements for rotary wing components as listed in the Range of Conditions
 - test and accurately and efficiently troubleshoot unserviceabilities and document the causes in rotary wing components
 - dismantle and inspect rotary wing component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify rotary wing component parts
 - assemble, balance as required, test for correct operation and adjust rotary wing components
- correctly tagging, sealing and packaging completed components.

The underlying skills inherent in this unit should be transferable across a range of repair and/or overhaul applications associated with aircraft components. It is essential that the maintenance procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures

- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - rotor blades
 - rotor heads, hinge assemblies and swashplates
 - transmission gear boxes, drive shafts and couplings.
- This must include demonstration of the following repair processes:
 - finishing or re-finishing of metal surfaces through processes, such as polishing, lapping and blending of damage within maintenance manual limits
 - removal of corrosion within maintenance manual limits
 - replacement of seals and gaskets
 - replacement of bearings
 - application of surface treatments, such as alodining
 - restoration of paint finishes.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

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MEA391 Repair and/or overhaul aircraft mechanical system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of relevant maintenance manuals, drawings and specifications to repair and/or overhaul a range of fixed and rotary wing aircraft mechanical components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Components may be from systems such as flight controls, landing gear retraction, nose wheel steering and transmissions other than those that are part of power plant assemblies.

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Determine requirements | 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 Mechanical components are inspected and/or operated through prescribed test procedures to establish serviceability or confirm defects, as required |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. Troubleshoot mechanical components | 2.1 Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | 2.2 Logical processes are used to ensure efficient and accurate troubleshooting |
| | 2.3 Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |
| | 2.4 Mechanical component faults are located and the causes of the faults are clearly identified |
| | 2.5 Fault rectification requirements are determined to assist in planning the repair |
| 3. Dismantle and inspect mechanical component parts | 3.1 Mechanical component parts are dismantled in accordance with maintenance manuals while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 3.2 Component parts are assessed for serviceability in accordance with the relevant maintenance |

- documentation
- 3.3 Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures
 - 3.4 Parts requiring non-destructive testing (NDT) are prepared for testing in accordance with the relevant maintenance documentation
 - 3.5 Parts lists are compiled and processed in accordance with standard enterprise procedures
- 4. Repair and/or modify mechanical
 - 4.1 Component parts are repaired or replaced in accordance with the relevant maintenance documentation
 - 4.2 Modification of components or parts is undertaken, where required, by relevant manufacturer's bulletins or procedures
- 5. Assemble, test and adjust mechanical components
 - 5.1 Mechanical component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 5.2 Components are adjusted, tested or calibrated to operate within prescribed specifications
 - 5.3 Finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
 - 5.4 Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Mechanical components include:

- Gear boxes and transmissions (except for helicopter components which are covered by MEA390 Repair and/or overhaul rotary wing dynamic components)
- Screwjacks
- Mechanical actuators
- Control rods, bellcranks, walking beams and links

Repair of component parts includes:

- Finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
- Removal of corrosion within maintenance manual limits
- Replacement of seals and gaskets
- Replacement of bearings
- Application of surface treatments, such as alodining
- Restoration of paint finishes

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA391A Repair and/or overhaul aircraft mechanical system components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA391 Repair and/or overhaul aircraft mechanical system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- using MSDS and applicable items of PPE
- using relevant maintenance documentation and aircraft/component manuals relating to mechanical system components to:
 - recognise state of serviceability and overhaul or repair requirements
 - test and accurately and efficiently troubleshoot unserviceabilities and document the causes
 - dismantle and inspect component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify component parts
 - assemble, test for correct operation and adjust components.

The underlying skills inherent in this unit should be transferable across a range of repair and overhaul applications associated with aircraft mechanical components. It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved.

This shall be demonstrated through application across a number of different aircraft components. Ability to assess component serviceability and interpret parts requirements will be necessary before undertaking any action.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the correct use of PPE
- WHS procedures
- fault diagnosis and component part inspection techniques
- system and component operation
- repair and overhaul procedures and processes.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general and special-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) component from each of the following groups:
 - gear boxes and transmissions (except for helicopter components which are covered by MEA390 Repair and/or overhaul rotary wing dynamic components)
 - screwjacks
 - mechanical actuators
 - control rods, bellcranks, walking beams and links.
- This must include demonstration of the following repair processes:
 - finishing or re-finishing of metal surfaces through processes, such as polishing and lapping
 - removal of corrosion within maintenance manual limits
 - replacement of seals and gaskets
 - replacement of bearings
 - application of surface treatments, such as alodining
 - restoration of paint finishes
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

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<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA392 Disassemble aircraft piston engines

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to disassemble aircraft piston engines during workshop repair and/or overhaul.

Applications include fixed and rotary wing aircraft piston engines and components and work may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---------------------------|-----|--|
| 1. | Determine requirements | 1.1 | Engine defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | | 1.2 | Piston engine is inspected in accordance with maintenance publications to establish serviceability state and confirm defects, if necessary |
| | | 1.3 | Piston engine build status is determined and quick engine change (QEC) components are recorded in accordance with standard enterprise procedures |
| | | 1.4 | Modification status and engine operating hours are clearly established from the engine log book to assist in determining the repair or overhaul requirements for the engine |
| | | 1.5 | Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. | Disassemble piston engine | 2.1 | Where applicable, QEC components are removed from the engine, maintenance requirements are determined, and necessary documentation is raised and packaged with the components |
| | | 2.2 | Any removed QEC components not requiring maintenance are correctly labelled and stored for reinstallation |
| | | 2.3 | Engine is installed in work stand and engine is cleaned |
| | | 2.4 | Engine is disassembled in accordance with maintenance publication and/or enterprise procedures while observing all relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE) |
| | | 2.5 | Removed components are cleaned, tagged and inspected for serviceability in accordance with |

enterprise procedures

- 2.6 Components that are not to be reinstalled are disposed of in accordance with enterprise procedures and action is initiated to obtain replacement components
- 2.7 Components to be re-fitted are processed for detailed inspection, repair/overhaul and/or modification, as required

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Piston engines include:

- The engine assembly and components that comprise a QEC unit. Engine types include all cylinder arrangements and fuel types (aviation gasoline, two stroke or diesel)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA392A Disassemble aircraft piston engines

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA392 Disassemble aircraft piston engines

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, enterprise procedures, specifications and aircraft/component manuals to:
 - recognise state of serviceability and overhaul or repair requirements for piston engines
 - accurately and efficiently troubleshoot unserviceabilities and document the causes for piston engines and components
 - dismantle and inspect piston engine component parts for serviceability
 - identify and initiate procurement for piston engine component parts/hardware that are discarded
 - identify and process engine components that require detailed inspection, repair, overhaul or modification.

Evidence of transferability of skills and knowledge related to repair and overhaul is essential. This shall be demonstrated through application across a number of different piston engines. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- fault diagnosis techniques
- system and component operation
- engine cleaning and disassembly procedures and component inspection for serviceability, including identification of life expired components
- enterprise documentation requirements.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of the engine types maintained by the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA393 Repair and/or overhaul aircraft piston engine cylinder assembly components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft piston engine cylinder assembly components.

Applications include components from fixed and rotary wing aircraft piston engines. Work may be performed individually or as part of a team.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Determine requirements | 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 Cylinder assembly components are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. Dismantle and inspect piston engine cylinder assembly components/parts | 2.1 Cylinder assembly component parts are dismantled in accordance with maintenance manual and/or enterprise procedures while observing relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE) |
| | 2.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |
| | 2.3 Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures |
| | 2.4 Parts requiring non-destructive testing (NDT) are prepared for testing in accordance with the relevant maintenance documentation |
| | 2.5 Parts lists are compiled and processed in accordance with standard enterprise procedures |
| 3. Repair and/or modify piston engine cylinder assembly components | 3.1 Component parts are repaired or replaced in accordance with the relevant maintenance documentation while observing relevant WHS procedures, including the use |

or parts		of MSDS and PPE
	3.2	Modification of components is undertaken where required by reference to relevant manufacturer bulletins or procedures, regulatory requirements and/or customer requirements
4. Assemble, test and adjust piston engine cylinder assembly components	4.1	Cylinder assembly component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing relevant WHS procedures, including the use of MSDS and PPE
	4.2	Components are tested and adjusted to operate within prescribed specifications
	4.3	Cylinder assemblies are prepared for engine reassembly
	4.4	Where components are not to be assembled into an engine the finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
	4.5	Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Piston engine cylinder assembly components include:

- Cylinder
- Piston and piston rings
- Piston pins
- Valves, valve rockers, valve guides, tappets, pushrods and guard tubes

- Manifold studs
 - Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level
 - Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
- Testing and adjustment:**
- Procedures and requirements include:**

Unit Mapping Information

Release 1 – equivalent to MEA393A Repair and/or overhaul aircraft piston engine cylinder assembly components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA393 Repair and/or overhaul aircraft piston engine cylinder assembly components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and overhaul or repair requirements for piston engine cylinder assembly components as listed in the Range of Conditions
 - dismantle and inspect piston engine cylinder assembly component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify piston engine cylinder assembly component parts
 - assemble, test for correct operation and adjust piston engine cylinder assembly components
- correctly tagging, sealing and packaging completed components.

Evidence of transferability of skills and knowledge related to repair is essential. This shall be demonstrated through application across a number of different piston engine cylinder assembly components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- component inspection and wear measurement procedures
- non-destructive testing methods and application
- component repair and overhaul procedures and processes.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Knowledge of cylinder assembly operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - cylinder
 - piston and piston rings
 - piston pins
 - valves, valve rockers, valve guides, tappets, pushrods and guard tubes
 - manifold studs.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA394 Repair and/or overhaul aircraft piston engine crankcase assembly components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to repair and overhaul aircraft piston engine crankcase assembly components.

Applications include components from fixed and rotary wing aircraft piston engines. Work can be performed individually or as a member of a team.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Determine requirements | 1.1 Component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers |
| | 1.2 Crankcase assembly components are inspected and/or operated through prescribed test procedures to establish serviceability and confirm defects, if necessary, while observing relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE) |
| | 1.3 Modification status is clearly established to assist in determining the overhaul requirements for the components |
| | 1.4 Extent of overhaul or repair is identified and documented in accordance with standard enterprise procedures |
| 2. Dismantle and inspect piston engine crankcase assembly components/parts | 2.1 Crankcase assembly component parts are dismantled in accordance with maintenance manual and/or enterprise procedures while observing relevant WHS procedures, including the use of MSDS and PPE |
| | 2.2 Component parts are assessed for serviceability in accordance with the relevant maintenance documentation |
| | 2.3 Parts requiring specialist repair are tagged and repair instructions are specified in accordance with standard enterprise procedures |
| | 2.4 Parts requiring non-destructive testing (NDT) are prepared for testing in accordance with the relevant maintenance documentation |
| | 2.5 Parts lists are compiled and processed in accordance with standard enterprise procedures |
| 3. Repair and/or modify | 3.1 Component parts are repaired or replaced in accordance |

piston engine crankcase assembly components or parts	3.2	with the relevant maintenance documentation Modification of components is undertaken where required by reference to relevant manufacturer's bulletins or procedures, regulatory requirements and/or customer requirements while observing relevant WHS procedures, including the use of MSDS and PPE
4. Assemble, test and adjust piston engine crankcase assembly components	4.1	Crankcase assembly component parts are assembled within specified tolerances and in accordance with the appropriate maintenance documents while observing relevant WHS procedures, including the use of MSDS and PPE
	4.2	Components are tested, adjusted or calibrated to operate within prescribed specifications
	4.3	Crankcase assembly is prepared for engine reassembly
	4.4	Where components are not to be assembled into an engine the finished components are tagged, sealed and packaged in accordance with standard enterprise procedures
	4.5	Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Piston engine crankcase assembly components include:

- Crankshaft, gears, con rods and counterweights
- Camshaft, hydraulic tappets/cam followers and gears
- Propeller shaft, reduction drive gear and quill shaft
- Component gear drives/trains
- Crankcase castings, bearings, component mounting pads and studs

- Oil system components
 - Supercharger and turbocharger components (where applicable to the enterprise)
 - Propeller governor (where applicable to the enterprise)
- Testing and adjustment:**
- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA394A Repair and/or overhaul aircraft piston engine crankcase assembly components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA394 Repair and/or overhaul aircraft piston engine crankcase assembly components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, specifications and aircraft/component manuals to:
 - recognise state of serviceability and overhaul or repair requirements for piston engine crankcase assembly components as listed in the Range of Conditions
 - dismantle and inspect crankcase assembly component parts for serviceability and identify repair requirements as applicable
 - repair/replace/modify crankcase component parts
 - assemble, test for correct operation and adjust crankcase assembly components
- correctly tagging, sealing and packaging completed components.

Evidence of transferability of skills and knowledge related to repair is essential. This shall be demonstrated through application across a number of different piston engine crankcase assembly components. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of crankcase assembly operation.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- component inspection and wear measurement procedures
- non-destructive testing methods and application
- component repair and overhaul procedures and processes.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general purpose tools and test equipment found in most routine situations would be used where appropriate
- Knowledge of crankcase assembly operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency and the performance criteria are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - crankshaft, gears, con rods and counterweights
 - camshaft, hydraulic tappets/cam followers and gears
 - propeller shaft, reduction drive gear and quill shaft
 - component gear drives/trains
 - crankcase castings, bearings, component mounting pads and studs
 - oil system components
 - supercharger and turbocharger components (may be omitted where not applicable to the enterprise)
 - propeller governor (may be omitted where not applicable to the enterprise)
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA395 Reassemble aircraft piston engines

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to reassemble aircraft piston engines during workshop repair and/or overhaul. Note that this relates to the bare engine and does not include the assembly of a quick engine change (QEC) unit. For QEC build-up refer to unit MEA396 Assemble aircraft piston engine quick engine change unit.

Applications include fixed and rotary wing aircraft piston engines and components. Work can be performed individually or as a member of a team.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|-----------------------------------|-----|---|
| 1. | Prepare to assemble piston engine | 1.1 | Engine build requirements are correctly interpreted and matched by part and serial numbers |
| | | 1.2 | Correct engine sub-assemblies and components are gathered for engine assembly and their serviceability state and modification status is confirmed in accordance with the relevant maintenance documentation and quality procedures |
| | | 1.3 | Required hardware and plumbing is obtained and confirmed as approved items |
| 2. | Reassemble piston engine | 2.1 | Piston engine sub-assemblies and components are prepared for reassembly in accordance with maintenance manual and/or enterprise procedures |
| | | 2.2 | Components are assembled and adjusted in accordance with the maintenance manual and/or enterprise procedures |
| | | 2.3 | Engine is assembled and components and linkages are adjusted in accordance with maintenance data requirements while observing relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE) |
| | | 2.4 | Reassembled engine is prepared for testing |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Piston engine sub-assemblies and components include:**
- Crankcase assembly
 - Cylinder assemblies
 - External lubrication system components
 - Propeller governor (where applicable to the enterprise)
 - Fuel system components
 - Ignition system components
 - Exhaust system components
 - Turbocharger and waste gate (where applicable to the enterprise)
- Testing and adjustment:**
- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA395A Reassemble aircraft piston engines

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA395 Reassemble aircraft piston engines

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, enterprise procedures, specifications and aircraft/component manuals to:
 - identify the required engine build level and configuration
 - recognise state of serviceability of the required sub-assemblies, components, hardware and plumbing
 - reassemble the engine and adjust components and linkages.

Evidence of transferability of skills and knowledge related to repair and overhaul is essential. This shall be demonstrated through application across a number of different piston engines. Ability to assess component/sub-assembly serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of adjustment procedures should also clearly indicate knowledge of system operation.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- fault diagnosis techniques
- system and component operation
- engine reassembly and component adjustment requirements.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of the engine types maintained by the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA396 Assemble aircraft piston engine quick engine change unit

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures to assemble aircraft piston engine quick engine change (QEC) units following engine repair and/or overhaul.

Applications include fixed and rotary wing aircraft piston engines and components. Work can be performed individually or as a member of a team.

This unit of competency is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Prepare to assemble piston engine QEC unit | 1.1 | QEC build requirements are correctly interpreted and matched by part and serial numbers |
| | | 1.2 | Correct QEC components are gathered for assembly and their serviceability state and modification status is confirmed in accordance with the relevant maintenance documentation and quality procedures |
| | | 1.3 | Required hardware and plumbing is obtained and confirmed as approved items |
| 2. | Assemble piston engine QEC unit | 2.1 | Piston engine is prepared for QEC assembly in accordance with maintenance manual and/or enterprise procedures |
| | | 2.2 | QEC components are assembled to the engine and adjusted in accordance with the maintenance manual and/or enterprise procedures while observing relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE) |
| | | 2.3 | QEC unit is assembled and components and linkages are adjusted in accordance with maintenance data requirements |
| | | 2.4 | Where required, QEC unit is prepared for testing |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Piston engine QEC unit components include:

Components from the following list, according to build requirements:

- Engine
- Engine mount frame
- External lubrication system components
- Baffles
- Heat shields
- fuel system plumbing
- pneumatic plumbing
- control linkages
- induction system
- exhaust system components
- turbocharger and waste gate
- tachometer generator and wiring
- vacuum pump
- air pump
- hydraulic pump
- fire warning system

Testing and adjustment:

- Complex testing and adjusting of components, where required, will be carried out under supervision at the appropriate level

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA396A Assemble aircraft piston engine quick engine change unit

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA396 Assemble aircraft piston engine quick engine change unit

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and PPE
- using relevant maintenance documentation, enterprise procedures, specifications and aircraft/component manuals to:
 - identify the required QEC build level and configuration
 - recognise state of serviceability of the QEC components, hardware and plumbing
 - assemble the QEC and adjust components and linkages.

Evidence of transferability of skills and knowledge related to repair and overhaul is essential. This may be demonstrated through application across a number of different piston engine QECs. Ability to assess component serviceability and interpret parts requirements will be necessary to supplement the required evidence. Capability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of adjustment procedures should also clearly indicate knowledge of system operation.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- fault diagnosis techniques
- system and component operation
- QEC assembly and component adjustment requirements.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.

- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) of the engine types maintained by the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA397 Test aircraft piston engines after repair or overhaul

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills, theory knowledge and maintenance publication procedures and/or standard enterprise procedures to test run aircraft piston engines, adjust operating parameters and troubleshoot/rectify faults.

Applications include all types of aircraft piston engines that are not installed in an airframe. Work can be performed individually or as a member of a team.

The unit is part of the Mechanical Certificate IV (Component Workshop Maintenance Stream) training pathway. It covers the competencies required to test aircraft piston engines that are not fitted to an airframe after repair or overhaul.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA392	Disassemble aircraft piston engines
MEA393	Repair and/or overhaul aircraft piston engine cylinder assembly components
MEA394	Repair and overhaul aircraft piston engine crankcase assembly components
MEA395	Reassemble aircraft piston engines
MEA396	Assemble aircraft piston engine quick engine change unit

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|----|--|-----|---|
| 1. | Prepare piston engine for test run | 1.1 | Documentation is checked to ensure that engine is ready for testing |
| | | 1.2 | Engine is installed in test rig or test cell, including connection of fuel, oil and electrical supplies and instrumentation while observing relevant work health and safety (WHS) procedures, including the use of material safety data sheets (MSDS) and personal protective equipment (PPE) |
| | | 1.3 | Sump or external oil tank is filled with correct grade and type of lubricating oil |
| | | 1.4 | Test rig/cell fuel tank is filled with correct type and grade of fuel |
| | | 1.5 | Correct propeller or club is fitted to the engine |
| | | 1.6 | Test rig/cell is prepared for operation |
| 2. | Run and test piston engine performance | 2.1 | Engine is started and operating parameters are checked in accordance with maintenance manual and standard enterprise procedures while observing relevant WHS procedures, including the use of MSDS and PPE |
| | | 2.2 | Engine performance is tested and adjusted, where applicable, in accordance with maintenance manual requirements and standard enterprise procedures |
| | | 2.3 | Engine operating parameters and test results are recorded in accordance with standard enterprise procedures |
| 3. | Troubleshoot piston engine faults | 3.1 | Available information from maintenance records and test results is used, where necessary, to assist in fault determination |
| | | 3.2 | Logical processes are used to ensure efficient and accurate troubleshooting |
| | | 3.3 | Specialist advice is obtained, where required, to assist with, or confirm, the fault and rectification requirement |

- | | | |
|----|----------------------------------|--|
| | 3.4 | Piston engine component faults are located and the causes of the faults are clearly identified |
| | 3.5 | Fault rectification requirements are determined to assist in determining if the engine must be returned to the workshop |
| 4. | Remove engine from test rig/cell | 4.1 Engine is removed from test rig/stand in accordance with maintenance manual requirements and standard enterprise procedures while observing relevant WHS procedures, including the use of MSDS and PPE |
| | 4.2 | Serviceable engines are configured, inhibited and prepared in accordance with maintenance manual requirements and standard enterprise procedures for transport or storage |
| | 4.3 | Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures |
| | 4.4 | Unserviceable engines are returned to workshop in accordance with standard enterprise procedures for rectification or re-work |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Testing and adjustment includes:

- Complex adjusting and testing of engine performance carried out under supervision

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA397A Test aircraft piston engines after repair or overhaul

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA397 Test aircraft piston engines after repair or overhaul

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- applying relevant WHS procedures, including the use of MSDS and items of PPE
- using relevant maintenance manuals and standard enterprise procedures to:
 - prepare engines for test running
 - install engines in test rigs or test cells
 - selecting and installing the correct propeller or test club
 - test run and adjust engine parameters, where applicable
 - troubleshoot faults identified during the test run
 - record engine operating parameters
 - remove engines from the test rig or test cell
 - complete documentation
- configuring and inhibiting serviceable engines for transport or storage.

It is essential that the maintenance procedures (including the use of correct fuels and lubricants) are interpreted and applied to ensure quality and safety standards are achieved.

Evidence of transferability of skills and knowledge related to engine test running is essential. This shall be demonstrated through application across a number of engine test runs. Capability to interpret test procedures and specifications (allowable limits) and apply them in practice is critical. The application of testing procedures should also clearly indicate knowledge of system operation.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- fault diagnosis techniques
- system and component operation
- repair and overhaul procedures and processes

- test rig or test cell operation
- engine test requirements
- engine operating parameters and adjustment methods.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment in an applicable engine test rig or test cell. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot engine faults before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of engine test runs.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A401 Inspect aircraft structures

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and use of maintenance documentation and manuals to inspect aircraft structure and identify damage and deterioration during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include the structure of fixed and rotary wing aircraft.

The unit is part of the Aeroskills Structures Maintenance Certificate IV and of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|----------------------------|-----|---|
| 1. | Inspect aircraft structure | 1.1 | Relevant maintenance documentation and modification status, including defect reports, where relevant, are used to identify specific inspection requirements |
| | | 1.2 | Appropriate preparation and access to the aircraft structure is undertaken to allow for proper inspection in accordance with maintenance documentation while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.3 | Aircraft structure is visually or physically checked for signs of deformation, defects or damage in accordance with maintenance documentation and approved procedures while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 1.4 | Damage or defects are assessed against damage or wear limits specified by structural repair manual or other approved data to determine if repair or replacement is required |
| | | 1.5 | Maintenance documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Preparation and access to structure includes:

- Preparation for non-destructive testing (NDT) (access to relevant structural zones and components)

Aircraft structure inspection includes:

- Non-ferrous and ferrous alloys and composite (FRP) materials used in aircraft construction
- Structural fastening and attachment hardware and/or devices
- Seals and sealants
- Glass and moulded plastics
- Application of NDT techniques
- Doors, hinges and locking mechanisms for damage/misalignment
- Inspections applicable to each of safe life, damage tolerant and fail safe structure relevant to enterprise
- Ageing aircraft inspection programs
- Visual inspection, physical checks, mensuration and alignment

Inspection techniques include:

Procedures and requirements include:

- Industry standards specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA401C Inspect aircraft structures

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA401 Inspect aircraft structures

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all relevant WHS procedures, including the use of PPE and MSDS
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying various aircraft metals and their basic properties
- identifying potential causes of structural failure
- demonstrating appropriate cleaning procedures to enable structure inspection
- demonstrating correct inspection procedures, in particular pressurised aircraft, in accordance with aircraft and procedures manuals
- performing aircraft mensuration and alignment checks
- identifying damage to aircraft metallic (ferrous and non-ferrous) structures and/or components by way of:
 - impact
 - fatigue
 - corrosion
- identifying the various forms of structural corrosion, stating the causes and structural effects of corrosion on aircraft
- identifying composite materials used in aircraft construction, associated safety precautions and hazards
- inspecting damage and assessing composite components/structures for:
 - impact damage
 - fatigue.

The underlying skills inherent in this unit should be transferable across a range of structural inspections associated with aircraft maintenance. It is essential that the procedures take into account all aircraft and personal safety precautions relating to aircraft structure.

Evidence is required of the ability to interpret and apply aircraft structural inspection requirements. This may be demonstrated through application across a range of structural components and materials. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical. The application of the procedures should also clearly indicate knowledge of structural flight loads.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft construction principles
- structural component attachment methods
- describing the construction methods used in:
 - fuselage sections
 - wing sections
 - engine nacelles and mounts
 - windows and window frames
 - doors, locks and access panels in pressurised and unpressurised aircraft
- defining of structural terms, i.e. safe life, damage tolerant, failsafe, stress, strain, shear and cycles
- inspection requirements for metal and composite structure, including:
 - ageing aircraft inspection requirements
 - safe life structure
 - damage tolerant structure
 - fail safe structure
- procedures and methodology for performing aircraft mensuration and alignment checks
- describing NDT methods and application of the various techniques
- describing construction methods of, and assessing common defects in, aircraft plastic transparencies
- describing basic constructional features of, and assessing common defects in, glass windscreens
- defining the terms associated with composite materials
- WHS procedures
- relevant PPE
- how to obtain MSDS.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) task from each of the following groups:
 - preparation for non-destructive testing (NDT) (access to relevant structural zones and components)

- inspection of:
 - non-ferrous and ferrous alloys and composite (FRP) materials used in aircraft construction
 - structural fastening and attachment hardware and/or devices
 - seals and sealants
 - glass and moulded plastics
 - application of NDT techniques
 - doors, hinges and locking mechanisms for damage/misalignment
 - inspections applicable to each of safe life, damage tolerant and fail safe structure relevant to enterprise
 - ageing aircraft inspection programs.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA405 Repair/modify aircraft composite material structure/components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use maintenance publications, applicable materials, tools and methods to repair aircraft composite material structure and components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

Applications include composite material structure and components from fixed and rotary wing aircraft either on-aircraft or in the workshop.

The unit is part of the Aeroskills Structures Maintenance Certificate IV training pathway, and of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA401 Inspect aircraft structures

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Plan repair/modification
 - 1.1 Extent of damage is correctly assessed to assist in determining repair procedure
 - 1.2 Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage
 - 1.3 Appropriate modification or repair scheme is identified in accordance with structural repair manual and/or approved data
 - 1.4 Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage criteria are out of limits
 - 1.5 All materials and equipment required are organised
2. Prepare components for hot bonding
 - 2.1 Components are prepared in accordance with applicable process specification while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
 - 2.2 Bagging is checked to ensure vacuum seal is correct
 - 2.3 Temperature probes are placed appropriately to provide accurate measurement
 - 2.4 Equipment is checked for serviceability to ensure safety in application
 - 2.5 Heat blanket is laid on component or repair in a manner that ensures even temperature distribution
3. Repair/modify components using hot bond
 - 3.1 Hot bonding equipment is operated in accordance with equipment manufacturer's procedures
 - 3.2 Vacuum and temperature recordings are monitored, including checking of hot and cold spots on trailing and leading temperature probes, to ensure specifications are met
 - 3.3 Curing cycle and recording of operating cycle data are monitored as required by approved procedures to ensure specifications are met

- 3.4 Blemishes are sealed, potted or filled, where necessary, in accordance with applicable process specification
 - 3.5 Component assemblies, including test pieces, requiring further or special treatment are made ready for the appropriate processes
 - 3.6 Required maintenance documentation is accurately completed and correctly processed
 - 3.7 Completed assemblies are tagged, sealed or packaged as required
4. Repair/modify components using cold cure
- 4.1 Lay up of materials is checked to confirm that components meet required specifications while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 4.2 Curing cycle is regularly monitored to ensure required specifications are met
 - 4.3 Components are checked for blemishes or delamination in accordance with quality procedures
 - 4.4 Component assemblies requiring further or special treatment are made ready for the appropriate processes
 - 4.5 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 4.6 Completed assemblies are tagged, sealed or packaged as required

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Applicable materials and methods include:

- Pre-preg materials hot cure (performed on one of carbon graphite, kevlar, fibreglass or aluminium)
- Cold cure or wet lay-up (using either fibreglass or carbon graphite)
- Core materials (using one of aluminium, nomex or foam)

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA405B Repair/modify aircraft composite material structure/components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA405 Repair/modify aircraft composite material structure/components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of PPE and MSDS
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying composite component applications in aircraft structures
- identifying various aircraft composite materials/resins and their basic properties by interpretation of markings and visual means
- handling and storing of composite materials to industry standards
- assessing composite component damage using visual and tap test methods
- performing composite component repairs using:
 - external patch repair
 - scarf repair
 - stepped repair
 - wet lay-up repair
 - composite fastener hole repair
 - metal to metal and metal to composite bonding
- correctly interpreting and /or producing repair scheme/modification drawings/sketches
- using appropriate hand tools and machines to disassemble and assemble aircraft composite components, parts, sections and skin, including extraction/installation equipment, drilling/cutting equipment, and material fasteners.

The underlying skills inherent in this unit should be transferable across the range of different material applications and curing requirements. It is essential that specific aspects of the laying up and curing process for aircraft composite materials are checked to ensure quality and safety standards are achieved in this area. Correct checking and wearing of safety protective clothing is critical, particularly in the hot bonding process.

Evidence of knowledge about repair techniques and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake component repair. Ability to apply different materials and curing cycles, including composite to composite and composite to metal components, will be necessary to indicate competency in preparing and curing composite materials.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures
- aircraft construction principles
- defining composite terminology
- composite component construction methods, including structural assembly fastener identification.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision using materials from each of:
 - pre-preg materials hot cure (performed on one of carbon graphite, kevlar, fibreglass or aluminium)
 - cold cure or wet lay-up (using either fibreglass or carbon graphite)
 - core materials (using one of aluminium, nomex or foam).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA406 Repair/modify aircraft non-primary structural sheet metal components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications to repair fixed and rotary wing aircraft non-primary structure sheet metal components under the guidance of a qualified person.

This unit is part of the Aeroskills Structures Maintenance Certificate II training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Prepare to perform routine repairs and minor modifications to aircraft non-primary structural sheet metal components | 1.1 | Applicable sheet metal repair scheme is determined in accordance with applicable maintenance documentation, enterprise procedures and qualified person guidance |
| | | 1.2 | All required materials and equipment are selected and organised in accordance with enterprise procedures and maintenance documentation |
| 2. | Perform routine repairs and minor modifications to aircraft non-primary structural sheet metal components | 2.1 | Sheet metal repairs are performed in accordance with approved repair scheme, ensuring that aircraft standard practices are used and standard process requirements are carried out while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 2.2 | Work area is cleaned of all waste material or adjustments |
| | | 2.3 | Under guidance of a qualified person, minor adjustments are made, where necessary, for components to operate within prescribed specifications |
| 3. | Complete routine repair and minor modification activities | 3.1 | Required documentation is accurately completed and correctly processed in accordance with enterprise procedures |
| | | 3.2 | Repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures, where required |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Sheet metal repairs include:**
- Removing corrosion by chemical and mechanical methods
 - Restoring protective coatings
 - Freehand precision hole generation
 - Removing and installing fastening devices
 - Routine repairs to non-primary structural sheet metal components

Work environment: Work is undertaken either autonomously or as part of a team and under the guidance of a qualified person.

Routine work is carried out using basic operational knowledge and a defined range of skills ('routine' work is that which follows a customary or regular course of procedure). All work outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality.

Competency application: Competency applies to the routine repair and/or minor modification of aircraft non-primary structural sheet metal components. Note that 'primary structure/structural' refers to all components of an aircraft, the failure of which would seriously endanger safety, for example, wing or tailplane spars, main fuselage frames, engine bearers, portions of skin that are highly stressed. 'Non-primary' refers to any other items. Note also that the scope of any modification and the procedure to be followed will be provided by the qualified person.

Scope: Repairs/modification undertaken are limited to the scope of skills and knowledge included in the unit of competency MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Procedures and requirements include:

- Industry standard specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA406B Repair/modify aircraft non-primary structural sheetmetal components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA406 Repair/modify aircraft non-primary structural sheet metal components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of PPE and MSDS
- using enterprise procedures, approved maintenance documentation and aircraft publications relating to aircraft sheet metal components
- identifying various aircraft metals used for sheet metal components and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metals used for sheet metal components, including sealing agents, to industry standards
- identifying aircraft sheet metal assembly fasteners (metal and non-metallic) by interpretation of markings, numbering systems, size, shape and colour
- correctly interpreting, with expert qualified person guidance and in accordance with enterprise procedures, sheet metal repair scheme/modification drawings and hand sketches
- using appropriate hand tools and machines under supervision to remove and assemble aircraft sheet metal components
- performing under guidance and in accordance with enterprise procedures a range of routine sheet metal repair techniques, including metal scab patch repairs
- applying corrosion removal/treatment techniques
- restoring sealing and surface finishes.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices, and processes associated with assembly.

Evidence of knowledge about enterprise procedures relating to basic repair techniques and the use of the standard repair manual/practices in a range of different routine repair situations will be necessary to supplement evidence of ability to plan and undertake component repair.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include a basic knowledge of:

- aircraft sheet metal component construction principles and repair techniques
- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures.

Assessment Conditions

- Competency should be assessed in the work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under qualified person guidance on at least one (1) item from each of the following groups:
 - removing corrosion by chemical and mechanical methods
 - restoring protective coatings
 - freehand precision hole generation
 - removing and installing fastening devices
 - routine repairs to non-primary structural sheet metal components.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA407 Repair/modify aircraft non-primary structural non-metallic components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications to repair fixed and rotary wing aircraft non-primary structure non-metallic components under the guidance of a qualified person.

This unit is part of the Aeroskills Structures Maintenance Certificate II training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Prepare to perform routine repairs and minor modifications to aircraft non-primary structural non-metallic components | 1.1 | Applicable non-metallic repair scheme is determined in accordance with applicable maintenance documentation, enterprise procedures and qualified person guidance |
| | | 1.2 | All required materials and equipment are selected and organised in accordance with enterprise procedures and maintenance documentation |
| 2. | Perform routine repairs and minor modifications to aircraft non-primary structural non-metallic components | 2.1 | Work is performed in accordance with approved repair scheme, ensuring that aircraft standard practices are used and standard process requirements are carried out while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 2.2 | Work area is cleaned of all waste material or adjustments |
| | | 2.3 | Under guidance of a qualified person, minor adjustments are made, where necessary, for components to operate within prescribed specifications |
| 3. | Complete routine repair and minor modification activities | 3.1 | Required documentation is accurately completed and correctly processed in accordance with enterprise procedures |
| | | 3.2 | Repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures, where required |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Materials and components include:

- Applicable non-metallic materials for the routine repair and/or minor modification under guidance of a qualified person to non-primary structural non-metallic components, as follows:
 - non-metallic materials include fibreglass, sandwich honeycomb, nylon, Perspex, nomex core materials, and matrix resins
 - components include interior trim panels (sidewalls, galleys, toilets, roof panels, floor panels), cargo lining, fairings and windows
- **Note** that ‘primary structure/structural’ refers to all components of an aircraft, the failure of which would seriously endanger safety, for example, wing or tailplane spars, main fuselage frames, engine bearers, portions of skin that are highly stressed. ‘Non-primary’ refers to any other items
- **Note** that the scope of any modification and the procedure to be followed will be provided by the qualified person

Work environment:

Work is undertaken either autonomously or as part of a team and under the guidance of a qualified person

Routine work is carried out using basic operational knowledge and a defined range of skills (‘routine’ work is that which follows a customary or regular course of procedure)

Work outcomes are achieved by applying known solutions chosen from a limited range of pre-determined options consistent with enterprise procedures. This includes accepting responsibility for own work in terms of quality of outcomes using pre-determined specifications of quality

Scope:

Skills and knowledge applied to repairs are limited to those specified in the unit of competency MEA109 Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Procedures and requirements include:

- Industry standard specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA407B Repair/modify aircraft non-primary structural non-metallic components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA407 Repair/modify aircraft non-primary structural non-metallic components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of PPE and MSDS
- using enterprise procedures, approved maintenance documentation and aircraft publications relating to aircraft non-primary structural non-metallic components
- identifying various aircraft non-primary structural non-metallic components and their basic properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft non-metallic components, including sealing agents, to industry standards
- identifying aircraft assembly fasteners by interpretation of markings, numbering systems, size, shape and colour
- correctly interpreting, with expert guidance and in accordance with enterprise procedures, non-primary structural non-metallic repair scheme/modification drawings and hand sketches
- using appropriate hand tools and machines under guidance of a qualified person to remove and assemble aircraft non-metallic components
- performing under guidance and in accordance with enterprise procedures a range of routine non-primary structural non-metallic repair techniques
- restoring sealing and surface finishes.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices, and processes associated with assembly.

Evidence of knowledge about enterprise procedures relating to routine basic repair techniques and the use of the standard repair manual/practices in a range of situations will be necessary to supplement evidence of ability to plan and undertake component repair under qualified person guidance.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft non-metallic component construction principles and repair techniques at a basic level
- how to obtain relevant MSDS
- the use of applicable items of PPE
- WHS procedures.

Assessment Conditions

- Competency should be assessed in the work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under qualified person guidance on a representative range of components, including interior trim panels (sidewalls, galleys, toilets, roof panels, floor panels), cargo lining, fairings and windows using applicable materials from:
 - non-metallic materials including fibreglass, sandwich honeycomb, nylon, Perspex, nomex core materials, and matrix resins.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA410 Maintain aircraft structure/components

Modification History

Release 2 – Assessment Conditions amended to permit assessment under simulated conditions

Application

This unit of competency requires application of hand skills and the use of maintenance publications to remove corrosion from aircraft structural materials during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include the metallic structure of fixed and rotary wing aircraft and structural components.

The unit is part of the Mechanical Aircraft Maintenance Engineer (AME) Certificate IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA401 Inspect aircraft structures

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---------------------------------------|---|
| 1. Prepare to remove corrosion damage | 1.1 Extent of damage is correctly assessed to assist in determining removal procedure |
|---------------------------------------|---|

- 1.2 Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage
 - 1.3 Appropriate corrosion removal procedure is identified in accordance with structural repair manual and/or approved data
 - 1.4 Specialist advice is obtained in establishing an approved repair scheme where a standard corrosion removal procedure cannot be identified or damage criteria is out of limits
 - 1.5 All materials and equipment required are organised
2. Remove corrosion damage
- 2.1 Corrosion removal is performed and protective coatings, sealants and jointing compounds applied in accordance with approved repair scheme ensuring that aircraft standard practices are used and process requirements are carried out including relevant work health and safety procedures and the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
 - 2.2 Structure/component is cleaned of all waste material or contaminants
 - 2.3 Components are adjusted, where necessary, to operate within prescribed specifications
 - 2.4 Required maintenance/repair documentation is completed and processed in accordance with standard enterprise procedures
 - 2.5 Repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures, where required

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Corrosion removal procedures include:

- Removing corrosion by chemical and mechanical methods
- Restoring protective coatings
- Applying sealants and jointing compounds
- Industry standard specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 2 – Assessment Conditions amended to permit assessment under simulated conditions. Equivalent.

Release 1 – equivalent to MEA410C Maintain aircraft structure/components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA410 Maintain aircraft structure/components

Modification History

Release 2 – Assessment Conditions amended to permit assessment under simulated conditions

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all relevant WHS procedures, including the use of MSDS and selection and use of applicable items of PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying various aircraft metals and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- applying structural corrosion removal/treatment techniques
- restoring aircraft structure sealing and surface finishes.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards, practices and processes associated with corrosion removal.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- methods of corrosion removal in aircraft structural metals
- types of corrosion typically found in various areas of aircraft structure
- removal of corrosion damage in integral fuel tanks and sealing of faying surfaces, including specific WHS and PPE requirements, including confined space entry requirements
- surface finishes and methods of restoration, including specific WHS and PPE requirements
- how to obtain MSDS
- relevant maintenance and structural repair manuals specifying corrosion removal limits and methods
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or a simulated work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- Evidence of knowledge about corrosion removal techniques and limits and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake structure and component repair by removal of corrosion within applicable limits.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) task from each of the following groups:
 - removing corrosion by chemical and mechanical methods
 - restoring protective coatings
 - applying sealants and jointing compounds.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A411 Remove surface coatings from aircraft or aircraft components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to preparation and masking of aircraft and aircraft components for coating removal and the removal of coatings using chemical and mechanical methods during scheduled or unscheduled maintenance working either individually or as part of a team.

No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations governing handling and disposal of hazardous materials are included in the unit.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Applications include fixed and rotary wing aircraft and aircraft components.

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Identify the appropriate coating removal method | 1.1 | The coating removal task is identified from maintenance documentation and enterprise procedures |
| | | 1.2 | Enterprise procedures and maintenance publications are used to identify materials and tools to be used for coating removal |
| | | 1.3 | Aircraft or component identification is matched with relevant maintenance documentation |
| 2. | Prepare for coating removal | 2.1 | Work health and safety (WHS) requirements are identified and complied with and personal protective equipment (PPE) is checked for correct fit and function |
| | | 2.2 | Materials and tools required for coating removal are assembled |
| | | 2.3 | Appropriate preparation for access to the aircraft is undertaken |
| | | 2.4 | Masking requirements are determined using enterprise procedures and maintenance publications |
| | | 2.5 | Masking is applied to relevant areas and sensitive components |
| | | 2.6 | Environmental requirements are observed during the coating removal process |
| 3. | Remove coating | 3.1 | Chemical strippers are applied in accordance with relevant procedures |
| | | 3.2 | Mechanical coating removal is performed in accordance with enterprise procedures and maintenance manuals |
| | | 3.3 | Surfaces are cleaned of all chemical residue and mechanical media in accordance with enterprise |

- procedures and maintenance manuals
- 3.4 Masking materials are removed and final cleaning of surfaces is performed
4. Clean up work area and maintain equipment
- 4.1 Material that can be reused is collected and correctly stored
- 4.2 Waste material is removed and disposed of or stored in accordance with legislative, regulatory and enterprise procedures
- 4.3 Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions
- 4.4 Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures
- 4.5 Tools are cleaned and maintained in accordance with enterprise procedures
- 4.6 Work area is cleaned and inspected for serviceable condition

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

WHS requirements are identified from relevant:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Procedures manuals
- Safety manuals
- Work instructions
- Maintenance organisation manuals

- Material safety data sheets (MSDS)
 - Defence regulations and instructions
 - Standing instructions
- Materials and tools include:**
- Masking tapes and barrier materials
 - Chemicals
 - Abrasives
 - Grinders
 - Scrapers
 - Paint stripper application pumps
 - Blasting equipment
 - Cleaning material
- Environmental requirements relate to:**
- Noise
 - Dust
 - Fume extraction
 - Clean-up management
- Legislative, regulatory and enterprise procedures include:**
- Commonwealth/state/territory environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials
 - MSDS
 - Maintenance organisation manuals
 - Procedures manuals
 - Work instructions
 - Relevant Defence regulations and instructions
 - Standing instructions

Unit Mapping Information

Release 1 – equivalent to MEA411A Remove surface coatings from aircraft or aircraft components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA411 Remove surface coatings from aircraft or aircraft components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS procedures relating to coating removal, including the selection and correct use of PPE
- selecting and applying masking and barrier materials
- selecting and using chemical strippers
- using MSDS
- selecting and using applicable mechanical coating removal methods
- cleaning of surfaces following coating removal
- correctly disposing of waste materials
- cleaning and maintenance of equipment and tools.

It is essential that system testing procedures, cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret coating removal procedures and apply them in practice is critical.

Evidence of transferability of skills and knowledge related to coating removal is essential. This is to be demonstrated through application of chemical and mechanical coating removal processes across a range of aircraft and component tasks.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant enterprise procedures and maintenance publications
- WHS procedures relating to the removal of aerospace coatings, including PPE and fume extraction
- how to obtain MSDS
- types of chemicals used for coating removal and methods of application
- mechanical methods that can be used for coating removal
- types of masking and barrier materials
- cleaning methods following coating removal

- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the range of coating removal tasks that are applicable to the enter[prise].
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA412 Pre-treat aluminium alloy surfaces

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the application of chemical conversion coatings to aluminium alloy surfaces of fixed and rotary wing aircraft and aircraft components with aluminium alloy surfaces during the performance of scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

No licensing requirements apply to this unit at the time of publication, but requirements for compliance with legislation and regulations for the handling and disposal of hazardous materials is included in the unit.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Prepare surfaces for application of chemical conversion coating | <p>1.1 The required pre-treatment task is identified from maintenance documentation and enterprise procedures</p> <p>1.2 Enterprise procedures and/or process specifications are used to identify required materials and tools</p> <p>1.3 Aircraft or component identification is matched with relevant maintenance documentation</p> <p>1.4 Work health and safety (WHS) requirements are identified and complied with and personal protective equipment (PPE) is checked for correct fit and function</p> <p>1.5 Common surface soils are removed in accordance with enterprise procedures and/or process specifications</p> <p>1.6 Masking is completed on areas where pre-treatment is not required</p> <p>1.7 Aluminium alloy substrate is prepared for application of conversion coating in accordance with enterprise procedures and/or process specifications</p> |
| 2. Apply chemical conversion coating | <p>2.1 The correct environment for conversion coating application is established and maintained</p> <p>2.2 The applicable chemical conversion coating is applied while observing all relevant WHS requirements, including the use of material safety data sheets (MSDS) and items of PPE</p> <p>2.3 Masking is removed and the aircraft or component is left in a suitable condition for the next task</p> <p>2.4 Completion of the pre-treatment process is documented in accordance with enterprise procedures</p> |
| 3. Clean up work area and maintain equipment | <p>3.1 Material that can be reused is collected and correctly stored</p> |

- 3.2 Waste material is removed and disposed of or stored in accordance with legislative, regulatory and enterprise procedures
- 3.3 Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- 3.4 Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures
- 3.5 Tools are cleaned and maintained in accordance with enterprise procedures
- 3.6 Work area is cleaned and inspected for serviceable condition

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

WHS requirements are identified from:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Procedures manual
- Safety manual
- Work instructions
- Maintenance organisation manual
- MSDS
- Defence regulations and instructions
- Standing instructions

Common surface soils

- Paint

include:

- Dirt
- Grease
- Oils
- Fuel
- Adhesives

Legislative, regulatory and enterprise procedures include:

- Commonwealth/state/territory environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials
- MSDS
- Maintenance organisation manual
- Procedures manual
- Work instructions
- Relevant Defence regulations and instructions
- Standing instructions

Unit Mapping Information

Release 1 – equivalent to MEA412A Pre-treat aluminium alloy surfaces

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA412 Pre-treat aluminium alloy surfaces

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS procedures relating to pre-treatment of aluminium alloy substrates, including the selection and correct use of PPE
- applying masking
- preparing for chemical conversion coating
- water break testing
- applying specified pre-treatment process
- water break re-testing
- using MSDS
- selecting and using applicable chemical conversion coating
- correctly disposing of waste materials
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of pre-treatment tasks associated with aircraft and aircraft component aluminium alloy surfaces. It is essential that applicable processes, cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret pre-treatment procedures and apply them in practice is critical.

This is to be demonstrated through application of conversion coatings to aluminium alloy surfaces across a range of aircraft and component tasks.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant enterprise procedures and/or process specifications
- WHS procedures relating to aluminium alloy pre-treatment processes, including PPE
- how to obtain MSDS
- types of masking and barrier materials
- types of pre-treatment processes

- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of pre-treatment tasks performed at the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA413 Seal aircraft and aircraft component structural seams

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the application of sealant to the surface seams of aircraft and aircraft components prior to surface coating application on fixed and rotary wing aircraft and aircraft components during the performance of scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations for the handling and disposal of hazardous materials is included in the unit.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Prepare to undertake seam sealing | 1.1 | The seam sealing task is identified from maintenance documentation and enterprise procedures |
| | | 1.2 | Applicable enterprise procedures, process specifications and maintenance publications are used to identify materials and tools to be used for seam sealing |
| | | 1.3 | Aircraft or component identification is matched with relevant maintenance documentation |
| 2. | Prepare seams for application of sealant | 2.1 | Work health and safety (WHS) requirements are identified and complied with and personal protective equipment (PPE) is checked for correct fit and function |
| | | 2.2 | Materials and tools required for sealant application are assembled |
| | | 2.3 | Masking is applied in accordance with enterprise procedures and/or process specifications |
| | | 2.4 | Seams are prepared for sealant application in accordance with enterprise procedures and/or process specifications |
| 3. | Mix sealant | 3.1 | Environment is established in accordance with enterprise procedures and/or process specifications |
| | | 3.2 | The applicable sealant is mixed in accordance with manufacturer's specifications while observing all relevant WHS requirements, including the use of material safety data sheets (MSDS) and items of PPE |
| 4. | Apply sealant to seams | 4.1 | Sealant is applied in accordance with enterprise procedures and/or process specifications while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 4.2 | The sealed seam is inspected and blemishes, voids or gaps are filled |
| | | 4.3 | Masking materials are removed |

- 4.4 Waste and/or surplus materials are disposed of in accordance with legislative, regulatory and enterprise procedures
- 4.5 Documentation is completed in accordance with standard enterprise procedures
- 4.6 Aircraft or component, equipment and work area is left in a condition enabling the next task to begin

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

WHS requirements are identified from:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Procedures manuals
- Safety manuals
- Work instructions
- Maintenance organisation manuals
- MSDS
- Defence regulations and instructions
- Standing instructions

Legislative, regulatory and enterprise procedures include:

- Commonwealth/state/territory environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials
- MSDS
- Maintenance organisation manuals
- Procedures manuals
- Work instructions
- Relevant Defence regulations and instructions
- Standing instructions

Unit Mapping Information

Release 1 – equivalent to MEA413A Seal aircraft and aircraft component structural seams

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA413 Seal aircraft and aircraft component structural seams

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS procedures relating to seam sealing, including the selection and correct use of PPE
- selecting and applying masking materials
- selecting, mixing and applying applicable sealants
- using MSDS
- selecting and using applicable enterprise procedures and/or process specifications
- correctly disposing of waste materials
- cleaning of work area and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of seam sealing tasks associated with surface seams of aircraft and aircraft components. It is essential that applicable processes, cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret seam sealing procedures and apply them in practice is critical.

This is to be demonstrated through application of sealant to surface seams across a range of aircraft and component tasks.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant enterprise procedures, process specifications and maintenance publications
- WHS procedures relating to seam sealing, including the selection and use of PPE
- how to obtain MSDS
- types of sealants used for seam sealing
- types of masking materials
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of seam sealing tasks that are performed at the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA414 Remove light corrosion from aircraft

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the removal of light corrosion from the surfaces of fixed and rotary wing aircraft structure.

No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations for the handling and disposal of hazardous materials is included in the unit.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Identify corrosion damage	1.1 Signs of corrosion are identified through visual inspection 1.2 The type of corrosion is identified 1.3 The severity of corrosion damage is determined and damage more severe than light surface corrosion is documented and reported in accordance with standard enterprise procedures
2. Remove light corrosion	2.1 The applicable corrosion removal method is selected in accordance with enterprise procedures 2.2 Work health and safety (WHS) requirements are identified and complied with and personal protective equipment (PPE) is checked for correct fit and function 2.3 Materials and tools required for corrosion removal are assembled 2.4 Surface is prepared and corrosion removed using the selected removal method
3. Clean area and equipment	3.1 Surface is cleaned of all chemical residue and mechanical media, in accordance with enterprise procedures, ready for the next process 3.2 Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions 3.3 Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures 3.4 Waste material is removed and disposed of or stored in accordance with legislative, regulatory and enterprise procedures 3.5 Documentation is completed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Signs of corrosion include:

- Surface deformed
- Paint blistered or flaked
- Powder
- Discolouration

Types of corrosion include:

- Uniform etch
- Pitting
- Intergranular
- Exfoliation
- Filiform
- Galvanic

WHS requirements are identified from:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Procedures manuals
- Safety manuals
- Work instructions
- Maintenance organisation manuals
- Material safety data sheets (MSDS)
- Defence regulations and instructions
- Standing instructions

Materials and tools include:

- Micro grinder
- Sanders
- Plastic media blasting equipment
- Abrasive pads
- Wet/dry abrasive papers
- Chemicals
- PPE applicable to task

Selected removal methods include:

- Light mechanical using micro grinder, sander or plastic media blasting
- Manual removal using wet/dry abrasive papers or

Legislative, regulatory and enterprise procedures include:

- abrasive pads
- Chemical
- Commonwealth/state/territory environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials
- MSDS
- Maintenance organisation manuals
- Procedures manuals
- Work instructions
- Relevant Defence regulations and instructions
- Standing instructions

Unit Mapping Information

Release 1 – equivalent to MEA414A Remove light corrosion from aircraft

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA414 Remove light corrosion from aircraft

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS procedures relating to light corrosion removal, including the selection and correct use of PPE
- recognising types of corrosion and of damage that exceeds light surface corrosion
- applying enterprise procedures for removal of light corrosion
- selection and use of applicable corrosion removal methods, equipment and tools
- using MSDS
- cleaning of surfaces following corrosion removal
- correctly disposing of waste materials
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of tasks involving the removal of light corrosion damage from the surfaces of aircraft structure. It is essential that applicable processes, cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret corrosion removal procedures and apply them in practice is critical.

This is to be demonstrated through corrosion removal using mechanical, manual and chemical means across a range of aircraft tasks.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant enterprise procedures and maintenance publications
- WHS procedures relating to the removal of aerospace coatings, including PPE
- how to obtain MSDS
- types of chemicals used for corrosion removal and methods of application
- mechanical methods that can be used for corrosion removal
- cleaning methods following corrosion removal

- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of light corrosion removal tasks using applicable mechanical, manual and chemical removal methods as listed in the Range of Conditions.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA415 Paint aircraft surfaces

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to final preparation of surfaces and application of paint finishes to fixed and rotary wing aircraft and aircraft components during the performance of scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations for the handling and disposal of hazardous materials is included in the unit.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
AURVTP2003	Prepare spray painting materials and equipment
AURVTP3012	Apply air dry and polyurethane enamel refinishing materials

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---------------------------|-----|--|
| 1. Prepare for painting | 1.1 | The painting task is identified from maintenance documentation and enterprise procedures and type of substrate is identified |
| | 1.2 | Enterprise procedures and maintenance publications are used to identify required materials and tools and necessary items are assembled |
| | 1.3 | Aircraft or component identification is matched with relevant maintenance documentation |
| | 1.4 | Surfaces are prepared for application of paint in accordance with enterprise procedures and/or process specification |
| | 1.5 | Masking and barrier materials are applied as required by task |
| 2. Apply primer | 2.1 | Work health and safety (WHS) requirements are identified and complied with and personal protective equipment (PPE) is checked for correct fit and function |
| | 2.2 | Temperature and humidity requirements are complied with |
| | 2.3 | Specified primer is applied in accordance with enterprise procedures and/or process specification |
| | 2.4 | Reject paintwork is identified and rectified in accordance with enterprise procedures and/or process specification |
| | 2.5 | Equipment is cleaned |
| 3. Apply surface top coat | 3.1 | WHS requirements are identified and complied with and PPE is checked for correct fit and function |

- 3.2 Temperature and humidity requirements are complied with
- 3.3 The specified top coat material is prepared in accordance with manufacturer's instructions
- 3.4 Top coat is applied in accordance with enterprise procedures and/or process specifications
- 3.5 Reject paintwork is identified and rectified in accordance with enterprise procedures and/or process specifications
- 3.6 Masking and barrier materials are removed and final finishing of the surface is completed as required
- 3.7 Documentation is completed in accordance with standard enterprise procedures
- 4. Clean up work area and maintain equipment
 - 4.1 Waste material is removed and disposed of or stored in accordance with legislative, regulatory and enterprise procedures
 - 4.2 Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions
 - 4.3 Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures
 - 4.4 Tools are cleaned and maintained in accordance with enterprise procedures
 - 4.5 Work area is cleaned and inspected for serviceable condition

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise.

Type of substrate includes:

- High strength steel
- Aluminium alloys
- Composite fibre
- Plastic
- Transparencies
- Magnesium alloy
- Fabric
- Wood

Required materials and tools include:

- Epoxy primers
- Lacquer primers
- Acrylic top coats
- Polyurethane top coats
- Chemicals
- Masking and barrier materials
- Low pressure gun or touch-up gun
- General purpose suction feed spray guns
- Airless spray units
- Electrostatic spray equipment
- Sanding/polishing equipment and materials
- PPE

WHS requirements are identified from relevant:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Procedures manuals
- Safety manuals
- Work instructions
- Maintenance organisation manuals
- Material safety data sheets (MSDS)
- Defence regulations and instructions
- Standing instructions

Legislative, regulatory and enterprise procedures include:

- Commonwealth/state/territory environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials
- MSDS
- Maintenance organisation manuals
- Procedures manuals
- Work instructions
- Relevant Defence regulations and instructions
- Standing instructions

Unit Mapping Information

Release 1 – equivalent to MEA415A Paint aircraft surfaces

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA415 Paint aircraft surfaces

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS procedures relating to paint application, including the selection and correct use of PPE
- selecting and applying masking and barrier materials
- identifying, preparing and using applicable primers and top coats
- using MSDS
- using manufacturer specifications and directions
- selecting and using applicable paint application equipment
- preparing surfaces for paint application
- correctly disposing of waste materials
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of paint application tasks associated with aircraft and aircraft components. It is essential that system testing procedures, cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret coating application procedures and apply them in practice is critical.

This is to be demonstrated through application of paint finishes across a range of aircraft and component substrate types.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant enterprise procedures, process specifications and maintenance publications
- WHS procedures relating to the application of aerospace coatings, including PPE and fume extraction
- how to obtain MSDS
- manufacturer specifications and directions
- types of paint finishes and applicability to various substrates
- procedures for preparing surfaces for paint application

- types of masking and barrier materials
- methods used for final finishing of surfaces
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of paint finish application tasks that are performed at the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A416 Apply aircraft identification markings, graphics and decals

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to preparation and application of fixed and rotary wing aircraft markings, graphics and decals during the performance of scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations for the handling and disposal of hazardous materials is included in the unit.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Interpret requirements and prepare materials for aircraft markings, graphics and decals | 1.1 | Requirements for markings, graphics and decals are determined from maintenance documentation, enterprise procedures and maintenance publications |
| | | 1.2 | Equipment for task is identified and gathered |
| | | 1.3 | Aircraft or component identification is matched with relevant maintenance documentation |
| | | 1.4 | Decals are prepared and matched with documentation |
| | | 1.5 | Markings or marking stencils are manufactured in accordance with drawings and specifications |
| | | 1.6 | Graphics or graphic stencils are manufactured in accordance with drawings and specifications |
| 2. | Prepare for application of aircraft markings and graphics | 2.1 | Work health and safety (WHS) requirements are identified and complied with and personal protective equipment (PPE) is checked for correct fit and function |
| | | 2.2 | Materials and equipment required for application of markings and graphics are assembled |
| | | 2.3 | Surface on which marking or graphic will be applied is cleaned in accordance with enterprise procedures |
| | | 2.4 | Marking or graphic position is accurately determined and masking is applied where necessary |
| 3. | Apply aircraft markings, graphics and decals | 3.1 | Environmental requirements for the application of markings and graphics are established in accordance with enterprise procedures |
| | | 3.2 | Markings and graphics are applied in accordance with enterprise procedures |
| | | 3.3 | Rework, gloss measuring and thickness measuring are performed, where applicable, in accordance with |

- enterprise procedures
- 3.4 Masking materials are removed, where applicable, and final clean-up is performed as required
 - 3.5 Decal positions are accurately determined, surfaces cleaned and decals applied in accordance with enterprise procedures
 - 3.6 Documentation is completed in accordance with standard enterprise procedures
4. Clean up work area and maintain equipment
- 4.1 Material that can be reused is collected and correctly stored
 - 4.2 Waste material is removed and disposed of or stored in accordance with legislative, regulatory and enterprise procedures
 - 4.3 Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions
 - 4.4 Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures
 - 4.5 Tools are cleaned and maintained in accordance with enterprise procedures
 - 4.6 Work area is cleaned and inspected for serviceable condition

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and

- Industry standard procedures specified by

- requirements include:** manufacturers, regulatory authorities or the enterprise.
- Markings include:**
- NATO
 - National or registration
 - Safety
- Graphics include:**
- Organisational logos or emblems
 - Decorative markings required by customer
- WHS requirements are identified from relevant:**
- Procedures manual
 - Safety manuals
 - Work instructions
 - Maintenance organisation manuals
 - Material safety data sheets (MSDS)
 - Defence regulations and instructions
 - Standing instructions
- Materials and equipment include:**
- Silk screen and/or frame
 - Spray guns
 - Vinyl plotter
 - Screen burner
 - Ink applicators
 - Rollers
 - Brushes
 - Vinyl applicators
 - Hazard tape
 - Masking tape
 - Mediums, including paint, ink and vinyl
 - PPE
- Application methods include:**
- Oil board
 - Vinyl (positive and negative)
 - Screen printing
 - Mask
 - Stencil
- Legislative, regulatory and enterprise procedures include:**
- Commonwealth/state/territory environmental legislation, regulations and codes for the storage and disposal of hazardous and toxic materials
 - MSDS
 - Maintenance organisation manuals
 - Procedures manuals
 - Work instructions
 - Relevant Defence regulations and instructions
 - Standing instructions

Unit Mapping Information

Release 1 – equivalent to MEA416A Apply aircraft identification markings, graphics and decals

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA416 Apply aircraft identification markings, graphics and decals

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS procedures relating to marking and graphic application, including the selection and correct use of PPE
- using procedures, maintenance manuals and finishing scheme drawings to determine the requirements for markings, graphics and decals
- selecting and applying masking and barrier materials
- manufacturing markings and graphics
- manufacturing stencils for the application of markings and graphics
- using MSDS
- cleaning of surfaces before and following the application of markings and graphics
- correctly disposing of waste materials
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of marking, graphic and decal application tasks associated with aircraft. It is essential that cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret drawing and specification requirements and application procedures and apply them in practice is critical.

This is to be demonstrated through application of various types of markings and graphics as listed in the Range of Conditions across a range of aircraft applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant enterprise procedures, maintenance publications, drawings and specifications
- manufacturer's specifications and directions
- WHS procedures relating to the application of markings and graphics to aircraft, including PPE and fume extraction
- how to obtain MSDS

- types of chemicals used for cleaning and surface preparation
- manufacturing methods for stencils
- types of masking and barrier materials
- cleaning methods following application of markings and graphics
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of marking and graphic application tasks that are performed at the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA417 Apply specialty coatings to aircraft

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the preparation and application of a range of specialty coatings to fixed and rotary wing aircraft and aircraft components using application methods applicable to the specific coating material during the performance of scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

No licensing requirements apply to this unit at the time of publication, but compliance with legislation and regulations for the handling and disposal of hazardous materials is included in the unit.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Determine specialty coating requirements	<p>1.1 Specialty coating requirements are identified from maintenance documentation and enterprise procedures</p> <p>1.2 Enterprise procedures and maintenance publications are used to identify materials and tools to be used for specialty coating application</p> <p>1.3 Aircraft or component identification is matched with relevant maintenance documentation</p>
2. Prepare surface for coating application	<p>2.1 Work health and safety (WHS) requirements are identified and complied with and personal protective equipment (PPE) is checked for correct fit and function</p> <p>2.2 Materials and equipment required for specialty coating application are assembled</p> <p>2.3 Surfaces are cleaned and degreased in accordance with enterprise procedures</p> <p>2.4 Final finishing of surfaces is performed in accordance with enterprise procedures and/or process specifications</p> <p>2.5 Reject parts and surfaces are identified, recorded and reported in accordance with standard enterprise procedures</p> <p>2.6 Masking is applied to relevant areas</p>
3. Prepare and apply coating	<p>3.1 The required coating is prepared in accordance with manufacturer's specifications and directions while observing all relevant WHS requirements, including the use of material safety data sheets (MSDS) and items of PPE</p> <p>3.2 Coating mix is inspected in accordance with enterprise procedures and/or process specifications</p> <p>3.3 Coating is applied to the required surfaces in accordance with enterprise procedures and/or process</p>

- specifications while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- 3.4 Coating is inspected for coating thickness and quality compliance with enterprise procedures and/or process specifications
 - 3.5 Defects in the coating are identified and rectified as required
 - 3.6 Masking materials are removed and final cleaning of surfaces is performed
 - 3.7 Documentation is completed in accordance with standard enterprise procedures
4. Clean up work area and maintain equipment
- 4.1 Waste material is removed and disposed of or stored in accordance with legislative, regulatory and enterprise procedures
 - 4.2 Equipment is cleaned in accordance with enterprise procedures or manufacturer's instructions
 - 4.3 Equipment is checked for serviceability and unserviceable items are dealt with in accordance with enterprise procedures
 - 4.4 Tools are cleaned and maintained in accordance with enterprise procedures
 - 4.5 Work area is cleaned and inspected for serviceable condition

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Specialty coatings include:

- Specialised inner layer coatings
- Engine coatings
- Leading edge coatings
- Radome coatings
- Waterborne heatproof paints
- Walkway compounds
- Fuel tank coatings
- Heatproof coatings
- Electrical conductive coatings

WHS requirements are identified from relevant:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Procedures manuals
- Safety manuals
- Work instructions
- Maintenance organisation manuals
- MSDS
- Defence regulations and instructions
- Standing instructions

Materials and equipment include:

- Chemicals
- Cleaning materials
- Specialty coating material
- Various spray guns
- Brush
- Roller
- Trowel
- PPE
- Baking oven
- Heat lamps
- Electrical test equipment
- Wet film thickness gauges

Defects in the coating include:

- Sags
- Runs
- Delamination
- Imperfections
- Dry spray
- Contamination
- Over-spray
- Egress

Legislative, regulatory and

- Commonwealth/state/territory environmental legislation,

**enterprise procedures
include:**

regulations and codes for the storage and disposal of hazardous and toxic materials

- MSDS
- Maintenance organisation manuals
- Procedures manuals
- Work instructions
- Relevant Defence regulations and instructions
- Standing instructions

Unit Mapping Information

Release 1 – equivalent to MEA417A Apply specialty coatings to aircraft

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA417 Apply specialty coatings to aircraft

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS procedures relating to specialty coating application, including the selection and correct use of PPE
- using procedures, process specification and manufacturer's data to identify coating preparation and application requirements
- selecting and applying masking materials
- selecting and using correct specialty coating
- using MSDS
- selecting and using applicable coating application methods
- cleaning and preparing surfaces for coating application
- correctly disposing of waste materials
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of specialty coating application tasks associated with aircraft. It is essential that cleanliness requirements and safety precautions, including the correct use of PPE, and application of environmental protection procedures are fully observed, understood and complied with. Ability to interpret drawing and specification requirements and application procedures and apply them in practice is critical.

This is to be demonstrated through application of various types of specialty coating as listed in the Range of Conditions across a range of aircraft applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant enterprise procedures and maintenance publications
- WHS procedures relating to the application of specialty aerospace coatings, including PPE
- relevant data from manufacturers of specialty coatings
- how to obtain MSDS
- criticality of areas of aircraft structure with regard to coating application

- cleaning processes and chemicals used to prepare surfaces for coating application
- coating application methods
- masking materials
- environmental legislation and regulations relating to the storage, use and disposal of hazardous materials.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a minimum of two (2) types of specialty coating on at least three (3) application tasks.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA418 Perform basic repair of aircraft internal fittings during line maintenance

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications to repair aircraft internal fittings, such as internal doors that are not part of the pressure hull, overhead storage compartments and doors and cabin furnishing items that are manufactured from either sheet metal or non-metallic materials and are within the privileges of the Aircraft Maintenance Engineer (AME) A Licence.

Applications include fixed and rotary wing aircraft and work may be performed during scheduled or unscheduled maintenance.

This is one of the units required for the granting of the chosen Aircraft Maintenance Engineer A Licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. Prepare to perform routine repairs and minor modifications to aircraft internal fittings | 1.1 | Applicable repair scheme is determined in accordance with applicable maintenance publications and enterprise procedures |
| | 1.2 | All required materials and equipment are selected and organised in accordance with enterprise procedures and maintenance publications |
| 2. Perform routine repairs to aircraft internal fittings | 2.1 | Sheet metal repairs and non-metallic material repairs are performed in accordance with approved repair scheme, ensuring that aircraft standard practices are used and standard process requirements are carried out while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 2.2 | Work area is cleaned of all waste material |
| | 2.3 | Adjustments are made, where necessary, for components to operate within prescribed specifications |
| 3. Complete routine repair activities | 3.1 | Required documentation is accurately completed and correctly processed in accordance with enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Sheet metal repairs include:**
- Removing corrosion by chemical and mechanical methods
 - Restoring protective coatings to repaired areas
 - Freehand precision hole generation
 - Removing and installing fastening devices
 - Routine repairs to sheet metal internal fittings
- Non-metallic material repairs include:**
- Repairs to fibreglass, sandwich honeycomb, nylon, Perspex, nomex core materials and matrix resins
 - Restoring protective coatings to repaired areas
 - Freehand precision hole generation
 - Removing and installing fastening devices
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA418A Perform basic repair of aircraft internal fittings during line maintenance

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA418 Perform basic repair of aircraft internal fittings during line maintenance

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of PPE and MSDS
- using enterprise procedures, approved maintenance documentation and aircraft publications relating to aircraft sheet metal and non-metallic internal fittings
- identifying various materials used for internal fittings and their basic properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metals used for sheet metal internal fittings, including sealing agents, to industry standards
- identifying aircraft sheet metal assembly fasteners (metal and non-metallic) by interpretation of markings, numbering systems, size, shape and colour
- correctly interpreting applicable repair schemes and hand sketches
- using appropriate hand tools and power tools under supervision to remove and assemble aircraft sheet metal internal fittings
- performing under guidance and in accordance with enterprise procedures a range of routine metal and non-metal repair techniques
- applying corrosion removal/treatment techniques
- restoring sealing and surface finishes to repaired areas.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices, and processes associated with repair and assembly.

Evidence of knowledge about enterprise procedures relating to basic repair techniques and the use of the standard repair manual/practices in a range of different routine repair situations will be necessary to supplement evidence of ability to plan and undertake internal fitting repairs.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant WHS procedures

- how to obtain relevant MSDS
- the use of applicable items of PPE
- aircraft sheet metal component construction principles and repair techniques at a basic level
- aircraft non-metallic component construction principles and repair techniques at a basic level.

Assessment Conditions

- Competency should be assessed in the work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of CASA and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under supervision but without intervention on a representative range of tasks involving the following:
 - sheet metal repairs involving:
 - removing corrosion by chemical and mechanical methods
 - restoring protective coatings to repaired areas
 - freehand precision hole generation
 - removing and installing fastening devices
 - routine repairs to sheet metal internal fittings
 - non-metallic material repairs involving:
 - repairs to fibreglass, sandwich honeycomb, nylon, Perspex, nomex core materials, and matrix resins
 - restoring protective coatings to repaired areas
 - freehand precision hole generation
 - removing and installing fastening devices.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA419 Inspect and repair/modify aircraft cabin/cockpit non-primary structure components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications to inspect for damage and repair aircraft non-primary structure metallic and non-metallic components of fixed and rotary wing aircraft cabins and cockpits during the performance of scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

This unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Inspect for damage to aircraft cabin/cockpit non-primary structure metallic and non-metallic components | 1.1 | Metallic and/or non-metallic components are visually inspected for damage |
| | | 1.2 | Extent of damage is determined and confirmed to be within repair limits |
| 2. | Prepare to perform routine repairs and minor modifications to aircraft cabin/cockpit non-primary structure metallic and non-metallic components | 2.1 | Applicable metallic or non-metallic repair scheme is determined in accordance with applicable maintenance documentation and standard enterprise procedures |
| | | 2.2 | Modification instructions are obtained in accordance with standard enterprise procedures |
| | | 2.3 | All required materials and equipment are selected and organised in accordance with enterprise procedures and maintenance documentation |
| 3. | Perform routine repairs and minor modifications to aircraft cabin/cockpit non-primary structure metallic components | 3.1 | Metallic component repairs and minor modifications are performed in accordance with approved repair scheme or modification instructions, ensuring that aircraft standard practices are used and standard process requirements are carried out while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 3.2 | Work area is cleaned of all waste material |
| | | 3.3 | Minor adjustments are made, where necessary, for components to operate within prescribed specifications |
| 4. | Perform routine repairs and minor modifications to aircraft cabin/cockpit non-primary structure | 4.1 | Non-metallic component repairs and minor modifications are performed in accordance with approved repair scheme or modification instructions, ensuring that aircraft standard practices are used and standard process requirements are carried out while |

non-metallic components		observing all relevant while observing all relevant WHS requirements, including the use of MSDS and items of PPE
	4.2	Work area is cleaned of all waste material
	4.3	Minor adjustments are made, where necessary, for components to operate within prescribed specifications
5. Complete routine repair and minor modification activities	5.1	Required documentation is accurately completed and correctly processed in accordance with standard enterprise procedures
	5.2	Repaired components or assemblies are tagged, sealed and packaged or cradled in accordance with specified procedures, where required

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Metallic and non-metallic components include:

- Aircraft crew and passenger seats
- Interior trim panels, including sidewalls, galleys, furnishings and partitions, passenger modules/pods, toilets, roof panels, overhead luggage stowage bins, non-structural floor panels and cargo compartment lining

Types of damage include:

- Corrosion, cracking and impact damage to metallic components
- Delamination, cracking and impact damage to non-metallic components

Metallic component repairs include:

- Removing corrosion by chemical and mechanical methods
- Restoring protective coatings
- Freehand precision hole generation

- Removing and installing fastening devices
 - Fitting patches to cabin/cockpit non-primary structure sheet metal components
 - Composite patch, scarf and stepped repairs using fibreglass, sandwich honeycomb, nylon, Perspex, nomex core materials and matrix resins
- Non-metallic component repairs include:**
- Primary structure includes:**
- All components of an aircraft, the failure of which would seriously endanger safety. In the fuselage this includes frames, longerons and stringers, structural floor panels and all additional parts of the pressure hull, such as skin, windows, doors and bulkheads
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA419A Inspect and repair/modify aircraft cabin/cockpit non-primary structure components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA419 Inspect and repair/modify aircraft cabin/cockpit non-primary structure components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of MSDS and the selection and use of applicable items of PPE
- using enterprise procedures, approved maintenance documentation and aircraft publications relating to cabin/cockpit non-primary structure metallic and non-metallic components
- identifying aircraft cabin/cockpit non-primary structure components and their basic properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metallic and non-metallic components, including sealing agents, to industry standards
- identifying aircraft assembly fasteners by interpretation of markings, numbering systems, size, shape and colour
- visually inspecting metallic and non-metallic components for damage
- correctly interpreting, in accordance with enterprise procedures, applicable repair scheme/modification drawings and hand sketches
- using appropriate hand tools and machines to remove and assemble aircraft cabin/cockpit non-primary structure metallic and non-metallic components
- performing, in accordance with enterprise procedures, a range of routine non-primary structure sheet metal repair techniques, including metal scab patch repairs
- performing, in accordance with enterprise procedures, a range of routine non-primary structure non-metallic repair techniques
- applying corrosion removal/treatment techniques
- restoring sealing and surface finishes.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. It is essential that procedures take into account all safety precautions and quality requirements, standards and practices, and processes associated with assembly.

Evidence of knowledge about enterprise procedures relating to routine basic repair techniques and the use of the standard repair manual/practices in a range of situations will be necessary to supplement evidence of ability to plan and undertake component repair.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- applicable WHS procedures, including how to obtain MSDS
- selection and use of applicable items of PPE
- construction methods used and assessment of common defects in aircraft crew and passenger seats, and in interior trim panels including sidewalls, galleys, furnishings and partitions, passenger modules/pods, toilets, roof panels, overhead luggage stowage bins, non-structural floor panels and cargo compartment lining
- types of deterioration and damage
- inspection methods
- identification and interpretation of metallic and non-metallic repair schemes applicable to cabin/cockpit non-primary structural components
- the various forms of corrosion
- the terms associated with composite materials
- requirements for handling and storing aircraft metals and composite materials including sealing agents, to industry standards
- means of identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved on a representative range of components, inspecting for damage and performing repair tasks, as follows:
 - metallic component repairs involving:
 - removing corrosion by chemical and mechanical methods
 - restoring protective coatings
 - freehand precision hole generation
 - removing and installing fastening devices
 - fitting patches to cabin/cockpit non-primary structure sheet metal components
 - non-metallic component repairs involving:
 - composite patch, scarf and stepped repairs using fibreglass, sandwich honeycomb, nylon, Perspex, nomex core materials and matrix resins.

- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA420 Fabricate basic structural components for aircraft

Modification History

Release 2 - Changes to Performance Evidence and to Knowledge Evidence.

Application

This unit of competency requires application of hand skills and the use of drawings, specifications and maintenance publications to fabricate basic structural components (that are flat or have only a single curve) requiring hand forming only from aluminium alloys and steel alloys at various states of temper during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include components for fixed and rotary wing aircraft.

The unit is part of the Aeroskills Structures Maintenance Certificate IV training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Interpret specifications and organise materials | 1.1 | Specifications and drawings are used to determine material requirements |
| | | 1.2 | Equipment use is planned by determining the procedure for fabricating component |
| | | 1.3 | Material is correctly identified in accordance with specifications |
| | | 1.4 | All materials and equipment are organised |
| 2. | Prepare material and tooling | 2.1 | Dimensions to material are translated in accordance with specifications |
| | | 2.2 | Cutting and forming equipment are prepared and adjusted to ensure accuracy of fabrication |
| | | 2.3 | Material is cut according to specifications ensuring minimisation of wastage and maintenance of surplus material identification while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 2.4 | Material requiring special treatment is prepared for the appropriate processes |
| | | 2.5 | Solution treatment of materials is carried out in accordance with approved procedures and specifications |
| 3. | Hand form material | 3.1 | Hand forming is accurately carried out ensuring that specifications are met while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 3.2 | Formed components are checked for irregularities and correction requirements determined |
| | | 3.3 | Irregularities are removed to meet required dimensions and specifications |

4. Inspect components
- 4.1 Fabricated components are inspected to confirm dimensional accuracy and specifications are met
 - 4.2 Checking fixtures are used, where appropriate, to ensure requirements are met
 - 4.3 Components requiring special or further treatment are prepared for the appropriate processes
 - 4.4 Completed components are tagged or identified, as required

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Components are to be fabricated:

- Using materials comprising various types of sheet metal used in aircraft manufacture, including aluminium alloys and structural steel alloys across a range of temper

Machinery processes include:

- Cutting, bending and drilling

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 2 - Changes to Performance Evidence and to Knowledge Evidence. Equivalent.

Release 1 – Equivalent to MEA420A Fabricate basic structural components for aircraft

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA420 Fabricate basic structural components for aircraft

Modification History

Release 2 - Changes to Performance Evidence and to Knowledge Evidence.

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and relevant items of PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying various aircraft metals and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metals to industry standards
- identifying aircraft structural assembly fasteners by interpretation of markings, numbering systems, size, shape and colour
- fabricating aircraft structural components and parts by:
 - correctly interpreting drawings, including third angle projection, isometric, sectional formats and hand sketches
 - developing component flat pattern using basic drawing tools, geometric drawing processes, calculating and applying bend allowance/deduction/setback
 - using appropriate hand tools and machines for cutting and drilling
 - assembling component parts using appropriate hand and machine tools and standard aircraft fasteners to industry standards
- applying appropriate metal heat treatment processes
- applying appropriate metal surface treatments.

The underlying skills inherent in this unit should be transferable across a range of aircraft applications. It is essential that procedures take into account all safety precautions and quality requirements. Skill and knowledge application must include set back, bend allowance and other standard practices associated with forming of material.

Evidence of knowledge and skills associated with basic structural fabrication techniques and their application to different materials used in aircraft manufacture will be required to supplement evidence of ability to fabricate basic aircraft structural components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft construction principles
- causes of structural fatigue and preventative measures
- structural corrosion and preventative measures
- aircraft structural drawings and repair scheme drawings
- material specifications for aluminium alloys and steel alloys used in aircraft structure
- structural material identification by markings and numbering systems
- material identification by chemical, electrical and mechanical methods
- material storage requirements
- hardware types and specifications
- identification of hardware
- sealants used in aircraft structure
- chemical surface treatments
- electroplating
- paints and finishes
- flat pattern development and associated terminology
- basic metal heat treatment metallurgy
- WHS precautions associated with fabrication of aircraft structural components
- MSDS
- PPE.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified by aircraft maintenance manuals. It is expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one structural fabrication task.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA421 Fabricate advanced structural components for aircraft

Modification History

Release 2 – Changes made to Performance Evidence and to Knowledge Evidence

Application

This unit of competency requires application of hand skills and the use of drawings, specifications and maintenance publications to fabricate advanced structural components involving complex and multiple curves and section shapes from aluminium alloys and steel alloys at various temper during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

Applications include components for fixed and rotary wing aircraft.

The unit is part of the Aeroskills Structures Maintenance Certificate IV training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Interpret specifications and organise materials | 1.1 | Specifications and drawings are used to determine material requirements |
| | | 1.2 | Equipment use is planned by determining the procedure for fabricating component |
| | | 1.3 | Material is correctly identified in accordance with specifications |
| | | 1.4 | All materials and equipment are organised |
| 2. | Prepare material and tooling | 2.1 | Dimensions to material is translated in accordance with specifications |
| | | 2.2 | Cutting and forming equipment are prepared and adjusted to ensure accuracy of fabrication |
| | | 2.3 | Material is cut according to specifications ensuring minimisation of wastage and maintenance of surplus material identification while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 2.4 | Material requiring special treatment is prepared for the appropriate processes |
| | | 2.5 | Solution treatment of materials is carried out in accordance with approved procedures and specifications |
| 3. | Form material | 3.1 | Appropriate forming procedure is determined ensuring that specifications are met and the most suitable forming method is selected |
| | | 3.2 | Templates are manufactured, where required, by forming method |
| | | 3.3 | Press tools are designed and manufactured, where required, by forming method |

- | | | | |
|----|------------------------------------|--|--|
| | 3.4 | Forming equipment is operated correctly and safely to form material in accordance with drawings and specifications | |
| | 3.5 | Hand forming is performed accurately, where necessary | |
| 4. | Hand correct fabricated components | 4.1 | Components are checked for irregularities and correction requirements determined |
| | | 4.2 | Irregularities are removed to meet required dimensions and specifications |
| 5. | Inspect components | 5.1 | Fabricated components are inspected to confirm dimensional accuracy and specifications are met |
| | | 5.2 | Checking fixtures are used, where appropriate, to ensure requirements are met |
| | | 5.3 | Components requiring special or further treatment are prepared for the appropriate processes |
| | | 5.4 | Completed components are tagged or identified, as required |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Components are to be fabricated:

- Using materials comprising various types of sheet metal used in aircraft manufacture, including aluminium alloys and structural steel alloys across a range of temper

Machinery processes include:

- Bending, cutting, rolling, shrinking and stretching

Procedures and

- Industry standard procedures specified by manufacturers,

requirements include: regulatory authorities or the enterprise

Unit Mapping Information

Release 2 – Changes made to Performance Evidence and to Knowledge Evidence. Equivalent.

Release 1 – equivalent to MEA421A Fabricate advanced structural components for aircraft

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA421 Fabricate advanced structural components for aircraft

Modification History

Release 2 – Changes made to Performance Evidence and to Knowledge Evidence

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- applying relevant WHS procedures, including the use of MSDS and applicable items of PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying various aircraft metals and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metals to industry standards
- identifying aircraft structural assembly fasteners by interpretation of markings, numbering systems, size, shape and colour
- fabrication of aircraft structural components and parts by:
 - correctly interpreting drawings, including third angle projection, isometric, sectional formats and hand sketches
 - developing component flat pattern using basic drawing tools, geometric drawing processes, calculating and applying bend allowance/deduction/setback Undertake component flat pattern development utilising:
 - parallel line
 - radial line
 - triangulation
 - using appropriate hand tools, machines (stretching, shrinking, bending, cutting, drilling, rolling, wheeling and folding), forming blocks, templates and presses to form/produce dished, domed, curved components, bent/angled (L, Z, U, hat) sections and lightening holes, flanges and joggles
 - assembling component parts using appropriate hand and machine tools and standard aircraft fasteners to industry standards
- applying appropriate metal heat treatment processes
- applying appropriate metal surface treatments.

The underlying skills inherent in this unit should be transferable across a range of aircraft applications. Evidence of knowledge and skills associated with the broad range of structural fabrication techniques and their application to different materials used in aircraft manufacture will be required to supplement evidence of ability to fabricate components.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft construction principles
- causes of structural fatigue and preventative measures
- structural corrosion and preventative measures
- aircraft structural drawings and repair scheme drawings
- material specifications for aluminium alloys and steel alloys used in aircraft structure
- structural material identification by markings and numbering systems
- material identification by chemical, electrical and mechanical methods
- material storage requirements
- hardware types and specifications
- identification of hardware
- sealants used in aircraft structure
- chemical surface treatments
- electroplating
- paints and finishes
- flat pattern development and terminology
- design and manufacture of templates
- design and manufacture of press tools
- methods for folding complex and nested sections
- machinery used for stretching, shrinking, bending, cutting, drilling and rolling, use of forming blocks, templates and press tools to form components
- use of forming blocks, templates and press tools to form components
- WHS precautions associated with fabrication of aircraft structural components
- MSDS
- PPE.

Assessment Conditions

- Competency should be assessed in the work environment, or simulated work environment, using tools and equipment specified by aircraft maintenance manuals. It is expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of structural fabrication tasks.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA422 Repair/modify aircraft metal structure

Modification History

Release 2 – Assessment Conditions amended to permit assessment in a simulated workplace

Application

This unit of competency requires application of hand skills, the use of special tools, structural repair manuals and approved repair schemes to repair aircraft structure during scheduled or unscheduled maintenance. Where fabrication of replacement components is required the applicable units are MEA420 Fabricate basic structural components for aircraft and MEA421 Fabricate advanced structural components for aircraft. Where major structural disassembly is required the applicable unit is MEA423 Aircraft structure major disassembly and reassembly.

Work may be performed individually or as part of a team.

Applications include the metal structure of fixed and rotary wing aircraft.

The unit is part of the Aeroskills Structures Maintenance Certificate IV training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA401 Inspect aircraft structures

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|----------------------|-----|---|
| 1. | Prepare to undertake | 1.1 | The extent of damage is correctly assessed to assist in |
|----|----------------------|-----|---|

repair		determining repair procedure
	1.2	Structure is prepared and supported in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage
	1.3	The appropriate modification or repair scheme is identified in accordance with structural repair manual and/or approved data
	1.4	Specialist advice in establishing an approved repair scheme is obtained where a standard repair scheme cannot be identified or damage is out of limits
	1.5	All required materials and equipment are organised
2.	Repair/modify aircraft structure	2.1 Structural repairs are performed in accordance with approved repair scheme, ensuring that aircraft standard practices are used and process requirements are carried out while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
		2.2 Work area is cleaned of all waste material or contaminants
		2.3 Components are adjusted, where necessary, to operate within prescribed specifications
		2.4 Repaired components or assemblies are tagged, sealed and packaged, or cradled in accordance with specified procedures, where required
		2.5 Required documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Repair procedures include:**
- Removing corrosion by chemical and mechanical methods
 - Restoring protective coatings
 - Applying sealants and jointing compounds
 - Freehand precision hole generation
 - Removing and installing structural hardware, fastening devices, bushes, bearings and bearing surfaces
 - Removing and repairing damaged sections and reinstall
- Procedures and requirements include:**
- Industry standard specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 2 - Assessment Conditions amended to permit assessment in a simulated workplace. Equivalent.

Release 1 – equivalent to MEA422A Repair/modify aircraft metal structure

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA422 Repair/modify aircraft metal structure

Modification History

Release 2 – Assessment Conditions amended to permit assessment in a simulated workplace

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and applicable items of PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structure
- identifying various aircraft metals and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- identifying various aircraft composite materials and their basic properties by interpretation of markings and visual means
- handling and storing aircraft metals and composite materials, including sealing agents, to industry standards
- identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour
- correctly assessing and describing the extent of damage
- correctly interpreting and/or producing repair scheme/modification drawings, including third angle projection, isometric, sectional formats and hand sketches
- using appropriate hand tools and machines to remove and assemble aircraft structural components, parts, sections and skin, including riveting equipment, drilling equipment, aligning tools and material fasteners (grip pins)
- applying correct removal, installation and repair techniques for:
 - a range of rivets (blind and solid) using hand, squeeze and pneumatic situations
 - a range of close tolerance fasteners (standard and oversize – hilocks, taper locks), including hole preparation
 - threaded devices, including internal and external thread cutting, helicoil inserts and damaged stud replacement
 - hardware assembled by close tolerance fits using heat, cooling and force methods, including bearings, bushes and inserts
- correctly supporting the aircraft structure by jacking, trestling and/or jiggling methods
- performing a range of metal structure repair techniques, including:
 - metal scab patch, flush, splice, lap and formed section repair
 - metal to metal and metal to composite bonding

- applying structural corrosion removal/treatment techniques
- restoring aircraft structure sealing and surface finishes.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques. Evidence of knowledge about repair techniques and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake structure and component repair.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft construction principles and the causes of structural damage, including metal fatigue and corrosion
- structural fatigue preventative measures
- structural corrosion removal and preventative measures
- aircraft repair schemes and modification data/drawings
- procedures for the design and approval of repair schemes and modifications
- material specifications for aluminium alloys and steel alloys used in aircraft structure
- structural material identification by markings and numbering systems
- material identification by chemical, electrical and mechanical methods
- material storage requirements
- hardware types and specifications
- identification of hardware
- sealants used in aircraft structure and their application and handling
- chemical surface treatments
- electroplating
- paints and finishes
- WHS precautions associated with repair of aircraft structure
- MSDS
- PPE.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least one (1) item from each of the following groups:
 - remove corrosion by chemical and mechanical methods

- restore protective coatings
- apply sealants and jointing compounds
- freehand precision hole generation
- remove and install structural hardware, fastening devices, bushes, bearings and bearing surfaces
- remove and repair damaged sections and reinstall.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA423 Aircraft structure major disassembly and reassembly

Modification History

Release 2 – Assessment Conditions amended to permit assessment in a simulated workplace

Application

This unit of competency requires application of hand skills and use of maintenance publications, drawings, and appropriate jigs, fixtures and tools to disassemble and reassemble aircraft structure during scheduled or unscheduled maintenance. Structural repair/modification is covered by MEA422 Repair/modify aircraft metal structure or MEA405 Repair/modify aircraft composite material structure/components. Where fabrication of replacement components is required the applicable units are MEA420 Fabricate basic structural components for aircraft and MEA421 Fabricate advanced structural components for aircraft.

Work may be performed individually or as part of a team.

Applications include fixed and rotary wing aircraft.

This unit of competency is part of the Aeroskills Structures Maintenance Certificate IV training pathway. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA401 Inspect aircraft structure

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Interpret specifications and organise materials
 - 1.1 The procedure for assembly/disassembly of structure is determined in order to plan equipment use
 - 1.2 Appropriate jigs, fixtures or bracing methods are selected to ensure maintenance of contour/structural integrity during disassembly/assembly operations
 - 1.3 All components and equipment are organised
2. Prepare aircraft or sub-assembly for structural disassembly
 - 2.1 Structure is supported with appropriate jigs, fixtures or bracing, as required
 - 2.2 Structural components are removed, as required, to provide access
3. Disassemble aircraft structure or sub-assembly
 - 3.1 Aircraft standard practices are applied in the removal of structural hardware and fasteners while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
 - 3.2 Disassembled components are tagged, as required, to facilitate correct reassembly
4. Prepare components and tooling for assembly
 - 4.1 Jigs and fixtures are set up to ensure accuracy of component assembly
 - 4.2 Replacement component alignment is checked for conformance to specifications prior to fastener hole generation
 - 4.3 Hole location/relocation is carried out in accordance with specification procedures and standard practices
 - 4.4 Standard practices in hole generation sequencing are followed to ensure that assembly stress defects are not built in
 - 4.5 Components are disassembled, cleaned, deburred and surface treatments applied prior to final assembly while observing all relevant WHS requirements, including the use of MSDS and items of PPE

- | | | | |
|----|---|-----|---|
| 5. | Assemble aircraft structure or sub-assembly | 5.1 | Sealants and/or adhesives are selected and applied in accordance with assembly specifications or applicable documentation while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | | 5.2 | Components are positioned and secured with appropriate temporary fastening devices for accurate assembly |
| | | 5.3 | Fasteners are selected and installed in accordance with assembly specifications or applicable manuals |
| 6. | Inspect completed assemblies | 6.1 | Assembled components are inspected to confirm dimensional accuracy and specifications are met |
| | | 6.2 | Checking or testing equipment is used, where appropriate, to ensure requirements are met |
| | | 6.3 | Aircraft mensuration is checked for compliance with applicable maintenance manuals, where necessary |
| | | 6.6 | Required documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Scope of unit applies to:

- Assembly of aircraft sub-assemblies or end items from detailed parts using jigs and fixtures
- Disassembly and reassembly of aircraft structure, such as wings, tailplanes or fuselage sections, using trestling, jigs and fixtures
- Replacement of major structural load carrying members,

- for example, skins, longerons, spars, frames and bulkheads
- Assembly procedures include:**
- Drilling, reaming and counter-sinking
 - Fitting of fasteners and rivets
 - Application of adhesives and sealants
 - Fitting of hardware
 - Application of corrosion inhibitors and protective coatings
- Assembly stress defects include:**
- Oil canning, buckling, contour misalignment and stress raisers
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 2 -Assessment Conditions amended to permit assessment in a simulated workplace. Equivalent.

Release 1 – equivalent to MEA423A Aircraft structure major disassembly and reassembly

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA423 Aircraft structure major disassembly and reassembly

Modification History

Release 2 – Assessment Conditions amended to permit assessment in a simulated workplace

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including the use of MSDS and applicable items of PPE
- using approved maintenance documentation and aircraft publications relating to aircraft structural disassembly and assembly
- correctly supporting the aircraft structure by jacking, trestling, bracing and/or jiggling methods
- safely handling heavy components during removal and assembly
- identifying various aircraft metals/composite materials and their basic metallurgy properties by interpretation of markings, numbering systems or visual, chemical or mechanical means
- handling and storing aircraft metal and composite components to industry standards
- identifying aircraft structural assembly fasteners (metal and composite) by interpretation of markings, numbering systems, size, shape and colour
- using appropriate hand tools and machines to remove and assemble aircraft structural components, parts, sections and skin, including riveting equipment, drilling equipment, aligning tools, reamers and material fasteners (grip pins)
- applying correct removal and installation techniques for general and close tolerance fasteners (rivets, standard and oversize hilocks), including hole preparation and location techniques
- performing aircraft alignment and mensuration checks
- applying sealants and restoring aircraft structure surface finishes.

The underlying skills inherent in this unit should be transferable into other areas that require similar techniques.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft construction principles, including the causes of structural fatigue and corrosion
- describing the basic construction methods used to assemble:

- fuselage (pressure and non-pressurised)
- wings, vertical and horizontal stabilisers, rotary wing tail cones and pylons
- engine nacelles/pylons
- doors and windows, including seals, sealants and locking mechanisms
- material specifications for aluminium alloys and steel alloys used in aircraft structure
- composite cloths, matrix materials and adhesives
- structural material identification by markings and numbering systems
- material identification by chemical, electrical and mechanical methods
- material storage requirements
- hardware types and specifications
- composite bonding methods
- identification of hardware
- sealants used in aircraft structure and their application and handling
- chemical surface treatments
- electroplating
- paints and finishes
- WHS precautions associated with repair of aircraft structure, including the safe handling of heavy components
- MSDS
- PPE.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment, using tools and equipment specified by aircraft maintenance manuals. It is also expected that general-purpose tools and ground support equipment found in most routine situations would be used where appropriate.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on elements from each of the following groups:
 - assembly of aircraft sub-assemblies or end items from detailed parts using jigs and fixtures
 - disassembly and reassembly of aircraft structure, such as wings, tailplanes or fuselage sections, using trestling, jigs and fixtures
 - replacement of major structural load carrying members, for example, skins, longerons, spars, frames and bulkheads.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA424 Evaluate aircraft non-destructive tests

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of competencies relating to non-destructive testing (NDT) techniques and related metallurgical knowledge in the research, analysis, development and evaluation of NDT tests for aircraft structure and components to Level 3 (*AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace*) during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The work can relate to scheduled and unscheduled maintenance activities on the metallic and composite structure of aircraft and aircraft components

Certification against applicable standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712:2005 Non-destructive testing – Qualification and certification of personnel.

The unit is part of the Diploma and Advanced Diplomas of Aeroskills (Non-Destructive Testing). The unit is similar to unit MEM24011B Establish non-destructive tests but observes the requirements of *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace* and of the Regulators; the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA); for the approval of procedures and the performance of NDT on aircraft and aircraft components.

Pre-requisite Unit

MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA133	Communicate aviation technical and maintenance management knowledge
MEM13013B	Work safely with ionising radiation
MEM16010A	Write reports
MEM24002B	Perform penetrant testing

MEM24004B	Perform magnetic particle testing
MEM24006B	Perform eddy current testing
MEM24008B	Perform ultrasonic testing
MEM24010B	Perform radiographic testing
MEM24012C	Apply metallurgy principles

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Assess requirements for NDT | <ul style="list-style-type: none"> 1.1 The inspection area is assessed for testing and all possible failure sites identified using metallurgical analysis 1.2 Information relevant to test development is collected from available sources using accepted techniques 1.3 Information is analysed and interpreted 1.4 Test requirements are determined |
| 2. Evaluate NDT techniques and procedures | <ul style="list-style-type: none"> 2.1 Test methods, techniques and procedures for specific NDT tasks are specified 2.2 Applicable codes, standards, specifications and procedures are interpreted 2.3 Test procedures are developed in accordance with established techniques and metallurgical principles |
| 3. Validate/confirm NDT tasks | <ul style="list-style-type: none"> 3.1 General and specific test procedures are validated in accordance with established techniques 3.2 Inspection results are interpreted in accordance with existing codes, standards and specifications |

4. Evaluate NDT test procedures
- 4.1 Procedures are evaluated for effectiveness
 - 4.2 Evaluation results are documented and reported in accordance with standard enterprise procedures
 - 4.3 Changes/amendments to NDT procedures are made and distributed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Test methods, techniques and procedures refer to:

- Standard techniques and procedures associated with:
 - penetrant testing
 - magnetic particle testing
 - eddy current testing
 - ultrasonic testing
 - radiographic testing

Codes, standards and specifications include:

- AAP7002.053 Technical airworthiness Management Manual
- Civil aviation Safety Regulations (CASR)
- overseas airworthiness regulators, such as the Federal Aviation Authority (FAA), European Aviation Safety Authority (EASA) and Transport Canada
- AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace
- NAS410 Revision 2 Certification and qualification of non-destructive testing personnel (February 2003)
- BS EN 4179:2009 Aerospace series. Qualification and approval of personnel for non-destructive testing
- BS EN 473:2008 Non-destructive testing. Qualification and certification of NDT personnel.

General principles

- ISO 9712:2005 Non-destructive testing – Qualification and certification of personnel
- Applicable materials and equipment specifications

Unit Mapping Information

Release 1 – equivalent to MEA424A Evaluate aircraft non-destructive tests

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA424 Evaluate aircraft non-destructive tests

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- conducting metallurgical assessment of inspection areas and identifying potential failure sites and modes
- designating most appropriate method, technique or procedure
- referencing aircraft maintenance information and regulatory requirements for inspection
- developing and validating test procedures
- applying safety procedures, standard operating procedures and legislative requirements to all work
- reading/interpreting/applying relative testing standards
- reading/interpreting/applying relative conformance standards
- documenting procedure and results
- submitting reports in accordance with standard enterprise procedures.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- definition of structural terms, i.e. safe life, damage tolerant, failsafe, stress, strain, shear and cycles
- inspection requirements for metal and composite structure, including:
 - ageing aircraft inspection requirements
 - safe life structure
 - damage tolerant structure
 - fail safe structure
- potential causes of structural failure
- metallurgical analysis to assess inspection areas and potential failure sites and modes
- NDT methods, techniques and procedures
- meaning and validity of relevant codes, standards, specifications and procedures
- regulatory requirements of the ADF and CASA relating to the use of NDT for inspection of aircraft structure and components

- test procedures for testing techniques and specimens
- validation processes
- process for approval of procedures
- process for documentation/distribution of procedures
- evaluation procedures
- process for documentation of evaluation results
- process for amending tests and distributing amendments
- national/Australian Standards, NOHSC guides, state/territory regulatory codes of practice/standards
- use and application of personal protective equipment (PPE)
- safe work practices and procedures
- relevant hazards and control measures related to the competency.

Assessment Conditions

- 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.
- 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.
- Assessors must be satisfied that the candidate can competently and consistently perform all elements and performance criteria of the unit of competency, including required knowledge, and be capable of applying the competency in new and different situations and contexts.
- This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the research, analysis, development, approval and evaluation of non-destructive tests, or other units requiring the exercise of the skills and knowledge covered by this unit.
- Assessors must be qualified at *AS 3669-2006 Non-destructive testing – Qualification and approval of personnel – Aerospace Level 3*.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA425 Perform bolted composite skin repairs

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance publications, applicable materials, tools and methods to repair aircraft composite skin surfaces during scheduled or unscheduled maintenance using bolted repair techniques. Work may involve individual and team-related activities.

Applications include composite skin surfaces from fixed and rotary wing aircraft and aircraft components either on-aircraft or in the workshop.

This unit of competency is part of the Aeroskills Structures Maintenance Certificate IV training pathway, and of the Mechanical Certificate IV (Aircraft Maintenance Stream) training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA401 Inspect aircraft structures

OR

MEA339 Inspect, repair and maintain aircraft structures

OR

MEA369 Inspect and maintain structures and related components of non-pressurised small aircraft

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1. Plan repair | 1.1. Extent of damage is correctly assessed to assist in determining repair procedure |
| | 1.2. Structure is supported and prepared in accordance with the applicable maintenance manual to ensure personnel safety and freedom from damage |
| | 1.3. Appropriate bolted repair scheme is identified in accordance with structural repair manual and/or approved data |
| | 1.4. Specialist advice is obtained in establishing an approved repair scheme where a standard repair scheme cannot be identified or damage criteria are out of limits |
| | 1.5. All materials and equipment required are organised |
| 2. Repair components using bolted patches | 2.1. Damage is cleaned up ready for repair while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 2.2. Patch material is obtained and patches are fabricated in accordance with the applicable repair scheme |
| | 2.3. Repair plug material is obtained and cut to size |
| | 2.4. Patches are fitted and secured with fasteners in accordance with the repair scheme while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 2.5. Applicable sealant is applied in accordance with the repair scheme |
| | 2.6. Surface finish is restored as required |
| | 2.7. Required maintenance documentation is completed and processed in accordance with standard enterprise procedures |

- 2.8 Completed assemblies are tagged, sealed or packaged as required

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Bolted repairs include:

- External
- Internal
- External/internal

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA425A Perform bolted composite skin repairs

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA425 Perform bolted composite skin repairs

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying while observing all relevant WHS requirements, including the use of MSDS and items of PPE
- using approved maintenance documentation and aircraft publications relating to bolted repairs to composite aircraft skin
- identifying composite component applications in aircraft structures
- identifying various aircraft composite materials and their basic properties by interpretation of markings and visual means
- identifying the range of bolted repair patch and repair plug materials
- identifying applicable fasteners
- identifying applicable sealants
- assessing composite component damage using visual and tap test methods
- performing composite skin bolted repairs:
 - external patch repair
 - internal patch repair
 - external/internal patch repair
- correctly interpreting and/or producing repair scheme/modification drawings/sketches
- using appropriate hand tools and machines to perform bolted repairs, including drilling/cutting equipment and material fasteners.

The underlying skills inherent in this unit should be transferable across the range of composite skin materials and patch materials and fasteners. Correct checking and wearing of PPE is critical.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft construction principles and the causes of structural damage, including metal fatigue and corrosion
- structural fatigue preventative measures
- composite terminology and materials used

- bolted repair methods
- types of patch material
- fastener types, specifications and identification
- plug materials
- use of scrim to prevent galvanic corrosion
- sealants used in bolted patch repairs and their application and handling
- paints and finishes for composite structure
- WHS precautions associated with repair of aircraft structure
- MSDS
- relevant PPE.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- Evidence of knowledge about bolted repair techniques and the use of the standard repair manual in a range of different repair situations will be necessary to supplement evidence of ability to plan and undertake repair.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the application of repair patches in each of the following types of repair :
 - external
 - internal
 - external/internal
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA430 Gas weld aircraft components

Modification History

Release 1 - New unit of competency

Application

The unit of competency requires application of the skills and knowledge of MEM05022C Perform advanced welding using oxy acetylene welding process, to the welding of applicable aircraft parent metal groups, as specified by the Regulators, during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit covers the development of competency elements required to gain approval within the Civil Aviation safety authority (CASA) or the Australian Defence Force (ADF) regulatory systems to gas weld aircraft components. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Prepare to perform repair or fabricate component using gas welding process | 1.1 | Materials or components to be welded and the applicable parent metal group are identified in accordance with applicable data |
| | | 1.2 | Correct welding equipment and consumables are selected and safely set up in accordance with standard operating procedures |
| | | 1.3 | Component (or materials) for welding are prepared |
| | | 1.4 | Equipment is adjusted ready for the welding process |
| 2. | Gas weld component | 2.1 | Welds are performed to the required standard in accordance with the applicable repair scheme or drawing while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 2.2 | Completed welds are inspected for defects and any defects rectified |
| 3. | Complete documentation | 3.1 | Required documentation is completed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Materials include:**
- Any metal used in the construction of aircraft components that is suitable for gas welding
- Components include:**
- Any aircraft component where gas welding is specified as either a fabrication or repair technique
- Parent metal group against which welding authorities are individually granted include:**
- Aluminium alloys
 - Magnesium alloys
 - Carbon steels and low alloy steels
 - Corrosion and heat resisting steels
 - Nickel alloys
 - Copper-based alloys
 - Titanium alloys
- Welding equipment includes:**
- Fuel gases
 - Cylinders
 - Regulators
 - Hoses
 - Torches and tips
- Consumables include:**
- Filler rods and fluxes as specified for the task
- Required standards are specified in:**
- Regulations relating to required test pieces
 - Process specifications
 - Repair manuals
 - Overhaul manuals
 - Australian and New Zealand Standards

Unit Mapping Information

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA430 Gas weld aircraft components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- safely applying advanced gas welding skills defined in unit MEM05022C Perform advanced welding using oxy acetylene welding process, to weld specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of gas welding of aircraft components or materials
- identifying weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to gas welding of aircraft components.

Evidence is required of the ability to produce gas welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding
- the procedure for assessment of weld test pieces
- the use of gas welding in relation to specified aircraft parent metal groups.

Assessment Conditions

- Test pieces specified for each parent metal group for which approval is sought shall be completed in either the workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought.
- Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the applicable Regulator.
- Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA431 Braze weld aircraft components

Modification History

Release 1 - New unit of competency

Application

The unit of competency requires application of the skills and knowledge of MEM05006C Perform brazing and/or silver soldering, to the brazing of applicable aircraft parent metal groups as specified by the Regulators during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit covers the development of competency elements required to gain approval within the Civil Aviation Safety Authority (CASA) or the Australian Defence Force (ADF) regulatory systems to braze weld aircraft components. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

<p>Elements describe the essential outcomes.</p>	<p>Performance criteria describe the performance needed to demonstrate achievement of the element.</p>
<p>1. Prepare to perform repair or fabricate component using braze welding process</p>	<p>1.1 Materials or components to be brazed and the applicable parent metal group are identified in accordance with applicable data</p> <p>1.2 Correct braze welding equipment and consumables are selected and safely set up in accordance with standard operating procedures</p> <p>1.3 Component (or materials) is prepared for braze welding</p> <p>1.4 Equipment is adjusted ready for the brazing process</p>
<p>2. Braze weld components</p>	<p>2.1 Braze welds are performed to the required standard in accordance with the applicable repair scheme or drawing while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)</p> <p>2.2 Completed welds are inspected for defects and any defects rectified</p>
<p>3. Complete documentation</p>	<p>3.1 Required documentation is completed in accordance with standard enterprise procedures</p>

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Materials include:**
- Any metal used in the construction of aircraft components that is suitable for braze welding
- Components include:**
- Any aircraft component where braze welding is specified as either a fabrication or repair technique
- Parent metal groups against which welding authorities are individually granted are:**
- Aluminium alloys
 - Magnesium alloys
 - Carbon steels and low alloy steels
 - Corrosion and heat resisting steels
 - Nickel alloys
 - Copper-based alloys
 - Titanium alloys
- Welding equipment includes:**
- Fuel gases
 - Cylinders
 - Regulators
 - Hoses
 - Torches
 - Tips and nozzles
- Consumables include:**
- Brazing rods and fluxes as specified for the task
- Required standards are specified in:**
- Regulations relating to required test pieces
 - Process specifications
 - Repair manuals
 - Overhaul manuals
 - Australian and New Zealand Standards

Unit Mapping Information

Release 1 – equivalent to MEA431A Braze weld aircraft components

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA431 Braze weld aircraft components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- safely applying braze welding skills defined in unit MEM05006C Perform brazing and/or silver soldering, to weld specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of braze welding of aircraft components or materials
- identifying braze weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to braze welding of aircraft components.

Evidence is required of the ability to produce braze welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding
- the procedure for assessment of weld test pieces
- the use of braze welding in relation to specified aircraft parent metal groups.

Assessment Conditions

- Test pieces specified for each parent metal group for which approval is sought may be completed in the workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought.

- Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the applicable Regulator.
- Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA432 Weld aircraft components using the gas tungsten arc welding process

Modification History

Release 1 - New unit of competency

Application

The unit of competency requires application of the skills and knowledge of MEM05044B Perform welds to code standards using gas tungsten arc welding process, to the welding of applicable aircraft parent metal groups as specified by the Regulators during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

This unit of competency covers the development of competency elements required to gain approval within the Civil Aviation Safety Authority (CASA) or the Australian Defence Force (ADF) regulatory systems to weld aircraft components using the gas tungsten arc welding (GTAW) process. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEM05044B	Perform welds to code standards using gas tungsten arc welding process
MEM05026C	Apply welding principles

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Prepare to perform repair or fabricate test pieces using GTAW process | 1.1 | Materials or components to be welded and the applicable parent metal group are identified in accordance with applicable data |
| | | 1.2 | Welding equipment is inspected for serviceability and correctly set up in accordance with standard operating procedures |
| | | 1.3 | Component (or materials) is prepared for welding |
| 2. | Gas tungsten arc weld component | 2.1 | Welds are performed to the required standard in accordance with the applicable repair scheme or drawing while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 2.2 | Completed welds are inspected for defects and any defects rectified |
| 3. | Complete documentation | 3.1 | Required documentation is completed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Materials include:

- Any metal used in the construction of aircraft components that is suitable for GTAW

- Components include:**
- Any aircraft component where GTAW is specified as either a fabrication or repair technique
- Parent metal groups against which welding authorities are individually granted are:**
- Aluminium alloys
 - Magnesium alloys
 - Carbon steels and low alloy steels
 - Corrosion and heat resisting steels
 - Nickel alloys
 - Copper-based alloys
 - Titanium alloys
- Required standards are specified in:**
- Regulations relating to required test pieces
 - Process specifications
 - Repair manuals
 - Overhaul manuals
 - Australian and New Zealand Standards

Unit Mapping Information

Release 1 – equivalent to MEA432A Weld aircraft components using the gas tungsten arc welding process

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA432 Weld aircraft components using the gas tungsten arc welding process

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- safely applying advanced GTAW skills defined in unit MEM05044B Perform welds to code standards using gas tungsten arc welding process, to weld specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of welding of aircraft components or materials using the GTAW process
- identifying weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to GTAW of aircraft components.

Evidence is required of the ability to produce gas tungsten arc welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding
- the procedure for assessment of weld test pieces
- the use of GTAW in relation to specified aircraft parent metal groups.

Assessment Conditions

- Test pieces specified for each parent metal group for which approval is sought may be completed in the workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought.

- Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the applicable Regulator.
- Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA433 Weld aircraft components using the gas metal arc welding process

Modification History

Release 1 - New unit of competency

Application

The unit of competency requires application of the skills and knowledge of MEM05043B Perform welds to code standards using gas metal arc welding process, to the welding of applicable aircraft parent metal groups as specified by the Regulators during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit covers the development of competency elements required to gain approval within the Civil Aviation Safety Authority (CASA) or the Australian Defence Force (ADF) regulatory systems to weld aircraft components using the gas metal arc welding (GMAW) process. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEM05043B	Perform welds to code standards using gas metal arc welding process
MEM05026C	Apply welding principles

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.	Prepare to perform repair or fabricate component using GMAW process	1.1	Materials or components to be welded and the applicable parent metal group are identified in accordance with applicable data
		1.2	Welding equipment is inspected for serviceability and set up correctly in accordance with standard operating procedures
		1.3	Component (or materials) is prepared for welding
2.	Gas metal arc weld component	2.1	Welds are performed to the required standard in accordance with the applicable repair scheme or drawing while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
		2.2	Completed welds are inspected for defects and any defects rectified
3.	Complete documentation	3.1	Required documentation is completed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Materials include:

- Any metal used in the construction of aircraft components that is suitable for GMAW

- Components include:**
- Any aircraft component where GMAW is specified as either a fabrication or repair technique
- Parent metal groups against which welding authorities are individually granted are:**
- Aluminium alloys
 - Magnesium alloys
 - Carbon steels and low alloy steels
 - Corrosion and heat resisting steels
 - Nickel alloys
 - Copper-based alloys
 - Titanium alloys
- Required standards are specified in:**
- Regulations relating to required test pieces
 - Process specifications
 - Repair manuals
 - Overhaul manuals
 - Australian and New Zealand Standards

Unit Mapping Information

Release 1 – equivalent to MEA433A Weld aircraft components using the gas metal arc welding process

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA433 Weld aircraft components using the gas metal arc welding process

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- safely applying advanced GMAW skills defined in unit MEM05043B Perform welds to code standards using gas metal arc welding process, to weld specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of welding of aircraft components or materials using the GMAW process
- identifying weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to GMAW of aircraft components.

Evidence is required of the ability to produce gas metal arc welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding
- the procedure for assessment of weld test pieces
- the use of GMAW in relation to specified aircraft parent metal groups.

Assessment Conditions

Test pieces specified for each parent metal group for which approval is sought may be completed in the workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought.

Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the applicable Regulator.

Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA434 Weld aircraft components using the plasma arc welding process

Modification History

Release 1 - New unit of competency

Application

The unit of competency requires application and adaption of the skills and knowledge of MEM05044B Perform welds to code standards using gas tungsten arc welding process, to the plasma arc welding (PAW) of applicable aircraft parent metal groups as specified by the Regulators during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit covers the development of competency elements required to gain approval within the Civil Aviation Safety Authority (CASA) or the Australian Defence Force (ADF) regulatory systems to weld aircraft components using the PAW process. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEM05044B	Perform welds to code standards using gas tungsten arc welding process
MEM05026C	Apply welding principles

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Prepare to perform repair or fabricate component using PAW process | 1.1 | Materials or component to be welded and the applicable parent metal group are identified in accordance with applicable data |
| | | 1.2 | Welding equipment is inspected for serviceability and correctly set up in accordance with standard operating procedures |
| | | 1.3 | Component (or materials) are prepared for welding |
| 2. | Plasma arc weld component | 2.1 | Welds are performed to the required standard in accordance with the applicable repair scheme or drawing while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 2.2 | Completed welds are inspected for defects and any defects rectified |
| 3. | Complete documentation | 3.1 | Required documentation is completed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Materials include:

- Any metal used in the construction of aircraft components that is suitable for PAW

- Components include:**
- Any aircraft component where PAW is specified as either a fabrication or repair technique
- Parent metal groups against which welding authorities are individually granted are:**
- Aluminium alloys
 - Magnesium alloys
 - Carbon steels and low alloy steels
 - Corrosion and heat resisting steels
 - Nickel alloys
 - Copper-based alloys
 - Titanium alloys
- Required standards are specified in:**
- Regulations relating to required test pieces
 - Process specifications
 - Repair manuals
 - Overhaul manuals
 - Australian and New Zealand Standards

Unit Mapping Information

Release 1 – equivalent to MEA434A Weld aircraft components using the plasma arc welding process

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA434 Weld aircraft components using the plasma arc welding process

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- safely applying advanced gas tungsten arc welding skills defined in unit MEM05044B Perform welds to code standards using gas tungsten arc welding process, and adapting them to perform PAW of specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of PAW of aircraft components or materials
- inspecting PAW process equipment for serviceability with particular emphasis on the orifice
- identifying weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to PAW of aircraft components.

Evidence is required of the ability to produce plasma arc welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding
- the procedure for assessment of weld test pieces
- equipment required for PAW and its operation and maintenance requirements
- the relative advantages of the plasma process for welding and cutting
- the composition of gases used in the PAW process
- safety precautions applicable to PAW and applicable PPE.

Assessment Conditions

- Test pieces specified for each parent metal group for which approval is sought may be completed in the workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought.
- Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the applicable Regulator.
- Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA435 Weld aircraft components using the manual metal arc welding process

Modification History

Release 1 - New unit of competency

Application

The unit of competency requires application of the skills and knowledge of MEM05046B Perform welds to code standards using manual metal arc welding process, to the welding of applicable parent metal groups as specified by the Regulators during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit covers the development of competency elements required to gain approval within the Civil Aviation Safety Authority (CASA) or the Australian Defence Force (ADF) regulatory systems to weld aircraft components using the manual metal arc welding (MMAW) process. Individuals will be authorised to weld specific parent metal groups, as specified in CAAP 33-1(1) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05026C	Apply welding principles

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

<p>Elements describe the essential outcomes.</p>	<p>Performance criteria describe the performance needed to demonstrate achievement of the element.</p>
<p>1. Prepare to perform repair or fabricate component using MMAW process</p>	<p>1.1 The materials or component to be welded and the applicable parent metal group are identified in accordance with applicable data</p> <p>1.2 Welding equipment is inspected for serviceability and correctly set up in accordance with standard operating procedures</p> <p>1.3 Component (or materials) is prepared for welding</p>
<p>2. Manual metal arc weld component</p>	<p>2.1 Welds are performed to the required standard in accordance with the applicable repair scheme or drawing while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)</p> <p>2.2 Completed welds are inspected for defects and any defects are rectified</p>
<p>3. Complete documentation</p>	<p>3.1 Required documentation is completed in accordance with standard enterprise procedures</p>

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Materials include:

- Any metal used in the construction of aircraft components that is suitable for MMAW

- Components include:**
- Any aircraft component where MMAW is specified as either a fabrication or repair technique
- Parent metal groups against which welding authorities are individually granted are:**
- Aluminium alloys
 - Magnesium alloys
 - Carbon steels and low alloy steels
 - Corrosion and heat resisting steels
 - Nickel alloys
 - Copper-based alloys
 - Titanium alloys
- Required standards are specified in:**
- Regulations relating to required test pieces
 - Process specifications
 - Repair manuals
 - Overhaul manuals
 - Australian and New Zealand Standards

Unit Mapping Information

Release 1 – equivalent to MEA435A Weld aircraft components using the manual metal arc welding process

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA435 Weld aircraft components using the manual metal arc welding process

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- safely applying advanced MMAW skills defined in unit MEM05046B Perform welds to code standards using manual metal arc welding process, to weld specified aircraft parent metal group materials or components to the standards specified by the relevant Regulator (CASA or the ADF)
- applying welding principles (unit MEM05026C Apply welding principles) in the context of MMAW of aircraft components or materials
- identifying weld requirements from applicable documentation
- selecting and correctly using items of PPE applicable to MMAW of aircraft components.

Evidence is required of the ability to produce manual metal arc welds to required specifications consistently across the range of components that are being fabricated or repaired, while applying all relevant safety precautions. The ability to do this must be demonstrated through the production of the test pieces specified for the welding process and parent metal group in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- regulatory requirements applicable to aircraft welding
- standards applicable to aircraft welding
- the procedure for assessment of weld test pieces.

Assessment Conditions

- Test pieces specified for each parent metal group for which approval is sought may be completed in the workplace or a simulated workplace. The individual must be provided with all required equipment, consumables, PPE, materials and data/drawings relating to the test pieces that are required for the approvals being sought.

- Assessment of test pieces must be carried out in a testing facility that meets the requirements specified by the applicable Regulator
- Assessment methods are specified in the CAAP 33-1(0) Aircraft manual welding: approvals and qualifications or RAAF Specification Engineering W5003 Welders – Qualification for Aircraft, Missile and Aerospace Fusion welding.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A501 Maintain and fit anti-G suits

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the maintenance and fitment of anti-G suits worn by aircrew and passengers in high performance aircraft. Maintenance involves inspection, testing, fault diagnosis, replacement of parts, repairs to fabric and cleaning. Fitment involves adjusting the anti-G suit to correctly fit an individual. Maintenance may be performed individually or as part of a team.

The scope of repairs excludes inflatable components of the anti-G suit.

This unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
ME A118	Conduct self in the aviation maintenance environment
ME A511	Operate and maintain sewing machines and overlockers

MSFSF2002

Machine sew materials

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|-------------------------|---|
| 1. Maintain anti-G suit | 1.1 Anti-G suit is inspected for serviceability in accordance with standard procedures |
| | 1.2 Anti-G suit is tested for serviceability in accordance with standard procedures and manufacturer's specifications |
| | 1.3 Identified faults beyond own authority to rectify are reported to supervisor and faulty anti-G suit is quarantined |
| | 1.4 Unserviceable parts of the anti-G suit are replaced and fabric repairs are completed in accordance with standards procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.5 Anti-G suit is cleaned in accordance with standard procedures |
| | 1.6 Anti-G suit is presented for inspection by supervisor in accordance with standard procedures |
| | 1.7 Maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. Fit anti-G suit | 2.1 Fitting process is explained to the participant so that optimal fit can be achieved |
| | 2.2 Participant is measured and appropriate size anti-G suit |

is selected

- 2.3 Anti-G suit is adjusted to optimise fit in conjunction with participant feedback
- 2.4 Anti-G suit fit is verified by the supervisor
- 2.5 Relevant documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Standard procedures are found in any or all of:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Australian Standards
- Equipment manufacturers' specifications and procedures
- Industry practices
- Safety manuals
- Maintenance schedules
- Work instructions
- Maintenance organisation manuals
- MSDS
- Defence regulations and instructions
- Standing instructions
- Broken zips and stitching
- Contamination
- Corrosion of metal parts, such as zippers
- Damaged hardware
- Excessive wear
- Incorrect manufacture
- Leaks
- Tears

Typical faults include:

- Anti-G suit replaceable parts include:**
- Eyelets
 - Press studs
 - Zips
- Adjustment of fit is effected by:**
- Lacing of torso and legs
 - Waist extension/reduction

Unit Mapping Information

Release 1 – equivalent to MEA501A Maintain and fit anti-G suits

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA501 Maintain and fit anti-G suits

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS practices relating to Anti-G suit maintenance processes, including the selection and correct use of PPE, where applicable
- using MSDS
- using applicable tools and maintenance documentation to:
 - test/inspect anti-G suits for serviceability
 - replace unserviceable components and repair fabric in accordance with approved procedures including sewing
 - select and use appropriate anti-G suit cleaning materials
 - correctly fit anti-G suits to users
- tying of knots, including:
 - reef knot
 - bowline
 - thumb knot
 - daisy chain
 - half hitch
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that anti-G suit testing and inspection procedures, cleanliness requirements and safety precautions, including the correct use of PPE, are fully observed, understood and complied with. Ability to interpret maintenance and fitting procedures and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to recognise faults and damage and perform appropriate repairs that are within the bounds of the individual's authority, and through the demonstration of correct fitting procedures on different sized individuals.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant enterprise procedures and maintenance publications
- WHS procedures relating to Anti-G suit maintenance, including the selection and use of PPE
- how to obtain MSDS
- G forces and anti-G suit operation during flight
- physiological effects of flight
- critical nature of maintaining and fitting anti-G suits
- forces of ejection
- operation of testing and measuring equipment and tools used to maintain anti-G suits
- inflation methods used in the maintenance of anti-G suits
- types of corrosion and contamination that may affect anti-G suits
- modification requirements for anti-G suits
- anti-G suit repair procedures and limitations
- lacing techniques used in the fitting of anti-G suits
- anti-G suit cleaning methods and materials
- handling, storage and transit procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of maintenance tasks and on the correct fitting of anti-G suits to at least three (3) different sized individuals.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA502 Maintain and fit helmets

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the maintenance and fitment of helmets worn by aircrew and passengers. Maintenance involves inspection, testing, fault diagnosis, replacement of parts, cleaning and functional testing. Fitment involves adjusting the helmet to correctly fit an individual. Maintenance may be performed individually or as part of a team.

Maintaining and fitting ancillary helmet equipment, such as illumination systems, night vision equipment and oxygen masks, is not part of this unit.

This unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA118	Conduct self in the aviation maintenance environment
MEA240	Use electrical test equipment to perform basic electrical tests

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | |
|--------------------|-----|---|
| 1. Maintain helmet | 1.1 | Helmet is inspected for serviceability in accordance with standard procedures |
| | 1.2 | Helmet is tested for serviceability in accordance with standard procedures and manufacturer's specifications |
| | 1.3 | Identified faults beyond own authority to rectify are reported to supervisor and faulty helmet is quarantined |
| | 1.4 | Unserviceable parts of the helmet are replaced in accordance with standards procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.5 | Communication system components are tested in accordance with standard procedures |
| | 1.6 | Helmet is cleaned in accordance with standard procedures |
| | 1.7 | Helmet is presented for inspection by supervisor in accordance with standard procedures |
| | 1.8 | Maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. Fit helmet | 2.1 | Fitting process is explained to the participant so that optimal fit can be achieved through relevant feedback |
| | 2.2 | Participant is measured to select an appropriate size helmet |
| | 2.3 | Components of helmet are adjusted to optimise fit |

- 2.4 Helmet fit is verified through participant feedback and by the supervisor
- 2.5 Relevant documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Standard procedures are found in any or all of:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Australian Standards
- Equipment manufacturers' specifications and procedures
- Industry practices
- Safety manual
- Maintenance schedules
- Work instructions
- Maintenance organisation manual
- MSDS
- Defence regulations and instructions
- Standing instructions
- Contamination
- Corrosion
- Cracks
- Delamination
- Fraying
- Incorrect manufacture
- Intermittent communication
- Scores/scratches
- Comfort pads
- Ear cup
- Ear cup pads

Faults include:

Replaceable parts of the helmet include:

- Liner
 - Retention straps
 - Visor
- Communication system components include:**
- Earphones
 - Microphone
 - Electric cables
 - Switches
- Components adjusted for fitment include:**
- Communications system (e.g. ear cup and microphone where fitted)
 - Comfort system (e.g. pads)
 - Retention system (e.g. strap)
 - Sizing system (e.g. liner)
 - Visor system

Unit Mapping Information

Release 1 – equivalent to MEA502A Maintain and fit helmets

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA502 Maintain and fit helmets

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS practices relating to helmet maintenance processes, including the selection and correct use of PPE, where applicable
- using MSDS
- using applicable tools and maintenance documentation to:
 - solder helmet electronic/electrical components
 - test the operation of helmet electronic/electrical components
 - replace unserviceable components in accordance with approved procedures including hand sewing, the use of hazardous chemicals and adhesives and thermal oven operation
 - select and use appropriate helmet cleaning materials
 - correctly fit helmets to users
- tying of knots, including:
 - reef knot
 - bowline
 - thumb knot
 - half hitch
- cleaning and maintenance of equipment and tools
- correctly disposing of hazardous waste.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that helmet testing and inspection procedures, cleanliness requirements and safety precautions, including the correct use of PPE, are fully observed, understood and complied with. Ability to interpret maintenance and fitting procedures and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to recognise faults and damage and perform appropriate repairs that are within the bounds of the individual's authority, and through the demonstration of correct fitting procedures.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant enterprise procedures and maintenance publications
- WHS procedures relating to helmet maintenance including the selection and use of PPE
- how to obtain MSDS
- components of a helmet and their function
- helmet operation in relation to flight
- physiological effects of flight
- aircraft crash dynamics
- critical nature of maintaining and fitting helmets
- need to regularly assess correct fitment of helmets
- helmet fitting procedures
- G forces
- forces of ejection
- basic electrical principles
- environmental conditions that may affect helmets
- approved cleaning methods for aviation life support equipment
- handling, storage and transit procedures relating to life support equipment
- types of corrosion and contamination that may affect helmets
- modification requirements for helmets
- helmet repair procedures and limitations
- soldering techniques
- operation of testing and measuring equipment and relevant specialist tools including thermal oven operation
- use and storage of adhesives.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least three (3) unserviceable helmets providing a representative range of maintenance tasks and on the correct fitting of helmets to at least three (3) individuals.

- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A503 Maintain and fit immersion suits

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the maintenance and fitment of immersion suits. Maintenance involves inspection, testing, fault diagnosis, replacement of parts and cleaning and may be performed individually or as part of a team.

Fitment involves adjusting the immersion suit to correctly fit an individual.

There are two types of immersion suits: quick don and constant wear. Quick don usually does not require fitting while constant wear is custom fitted to the individual.

This unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
ME A118	Conduct self in the aviation maintenance environment

LMTTF2008A

Use adhesives

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|-------------------------|-----|---|
| 1. | Maintain immersion suit | 1.1 | Immersion suit is inspected for serviceability in accordance with standard procedures |
| | | 1.2 | Immersion suit is tested for serviceability in accordance with standard procedures and manufacturer's specifications |
| | | 1.3 | Identified faults beyond own authority to rectify are reported to supervisor and faulty immersion suit is quarantined |
| | | 1.4 | Unserviceable parts of the immersion suit are replaced while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.5 | Immersion suit is cleaned in accordance with standard procedures |
| | | 1.6 | Immersion suit is re-packed in accordance with standard procedures |
| | | 1.7 | Immersion suit is presented for inspection by supervisor in accordance with standard procedures |
| | | 1.8 | Maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. | Fit immersion suit | 2.1 | Fitting process is explained to the participant so that optimal fit can be achieved |

- 2.2 Participant is measured and appropriate size immersion suit is selected
- 2.3 Immersion suit is adjusted to optimise fit in conjunction with participant feedback
- 2.4 Immersion suit fit is verified by the supervisor
- 2.5 Relevant documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Standard procedures are found in any or all of:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Australian Standards
- Equipment manufacturers' specifications and procedures
- Industry practices
- Safety manuals
- Maintenance schedules
- Work instructions
- Maintenance organisation manuals
- MSDS
- Defence regulations and instructions
- Standing instructions
- Contamination
- Corrosion of metal parts, such as zippers
- Delamination
- Incorrect manufacture
- Leaks
- Lifting of tapes
- Scuffing (e.g. boot)

Faults include:

Parts of the immersion suit include:

- Tears in suit and/or seals
- Boots
- Gloves
- Life line
- Light
- Seals (e.g. wrist, neck)
- Whistle

Adjustment of the immersion suit includes:

- Leg length
- Sleeve length
- Trimming seals

Unit Mapping Information

Release 1 – equivalent to MEA503A Maintain and fit immersion suits

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA503 Maintain and fit immersion suits

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS practices relating to immersion suit maintenance processes, including the selection and correct use of PPE, where applicable
- using MSDS
- using applicable tools and maintenance documentation to:
 - test/inspect immersion suits for serviceability
 - replace unserviceable components in accordance with approved procedures, including the use of hazardous materials and adhesives
 - select and use appropriate immersion suit cleaning materials
 - correctly fit immersion suits to users
- operating specialist equipment, including:
 - heat press
 - vacuum heat sealer
 - 3 stage in-line breathing apparatus
 - filter extraction systems
 - spill kits
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that immersion suit testing and inspection procedures, cleanliness requirements and safety precautions, including the correct use of PPE, are fully observed, understood and complied with. Ability to interpret maintenance and fitting procedures and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to recognise faults and damage and perform appropriate repairs that are within the bounds of the individual's authority, and through the demonstration of correct fitting procedures.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- WHS procedures relating to immersion suit maintenance, including the selection and use of PPE
- how to obtain MSDS
- emergency procedures in relation to chemical spills and emergency evacuation of personnel in distress
- chemical disposal procedures
- requirements for storage of adhesives
- cold shock and hypothermia in relation to survival
- priorities of survival and how they relate to immersion suits and associated ancillary equipment
- physiological effects of flight
- critical nature of maintaining and fitting immersion suits
- materials used to manufacture immersion suits (i.e. neoprene and gortex)
- operation of testing and measuring equipment and tools used to maintain immersion suits
- components of an immersion suit and their function
- types of corrosion and contamination that may affect immersion suits
- modification requirements for immersion suits
- immersion suit repair procedures and limitations
- immersion suit cleaning methods and materials
- handling, storage and transit procedures relating to life support equipment
- handling and storage procedures relating to immersion suits (i.e. MACPAC highly susceptible to damage)
- specialist equipment operation, including:
 - heat press
 - vacuum heat sealer
 - 3 stage in-line breathing apparatus
 - filter extraction systems
- spill kits.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a representative range of maintenance tasks and on the correct fitting of immersion suits.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A504 Maintain and fit oxygen masks

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the maintenance and fitment of oxygen masks worn by aircrew. Maintenance involves inspection, testing, fault diagnosis, replacement of parts, cleaning and functional testing and may be performed individually or as part of a team.

Fitment involves adjusting the oxygen mask to correctly fit an individual (oxygen masks are not an off-the-shelf issue).

This unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
ME A118	Conduct self in the aviation maintenance environment
ME A240	Use electrical test equipment to perform basic electrical tests

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|----------------------|-----|--|
| 1. | Maintain oxygen mask | 1.1 | Oxygen mask is inspected for serviceability in accordance with standard procedures |
| | | 1.2 | Oxygen mask is tested for serviceability in accordance with standard procedures and manufacturer's specifications |
| | | 1.3 | Identified faults beyond own authority to rectify are reported to supervisor and faulty oxygen mask is quarantined |
| | | 1.4 | Unserviceable parts of the oxygen mask are replaced in accordance with standards procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.5 | Communication system components are tested in accordance with standard procedures |
| | | 1.6 | Oxygen mask is cleaned in accordance with standard procedures |
| | | 1.7 | Oxygen mask is presented for inspection by supervisor in accordance with standard procedures |
| | | 1.8 | Maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. | Fit oxygen mask | 2.1 | Fitting process is explained to the participant so that optimal fit can be achieved through relevant feedback |
| | | 2.2 | Participant is measured to select an appropriate size |

oxygen mask

- 2.3 Components of oxygen mask are adjusted to optimise fit
- 2.4 Integration of the oxygen mask and helmet is confirmed for correct function during operations
- 2.5 Oxygen mask fit is verified through participant feedback and by the supervisor
- 2.6 Relevant documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Standard procedures are found in any or all of:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Australian Standards
- Equipment manufacturers' specifications and procedures
- Industry practices
- Safety manuals
- Maintenance schedules
- Work instructions
- Maintenance organisation manuals
- MSDS
- Defence regulations and instructions
- Standing instructions
- Contamination
- Corrosion
- Cracks
- Excessive wearing
- Fraying

Faults include:

- Incorrect manufacture
 - Intermittent communication
 - Leaks
 - Perishing
 - Communication system (e.g. microphone)
 - Delivery tube
 - Exo-skeleton (e.g. outer shell)
 - Face piece (e.g. trimming)
 - Retention system (e.g. strap)
 - Valves
 - Microphone
 - Electric cables
 - Switches
 - Retention system (e.g. strap)
 - Seals
- Parts of the oxygen mask include:**
- Communication system components include:**
- Adjustable components include:**

Unit Mapping Information

Release 1 – equivalent to MEA504A Maintain and fit oxygen masks

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA504 Maintain and fit oxygen masks

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS practices relating to oxygen mask maintenance processes
- using MSDS
- using applicable tools, testing/measuring equipment and maintenance documentation to:
 - solder oxygen mask electronic/electrical components
 - test the operation of helmet electronic/electrical components
 - replace unserviceable components in accordance with approved procedures
 - select and use appropriate oxygen mask cleaning materials
 - correctly fit oxygen masks to users
- safely using the oxygen test rig
- cleaning and maintenance of equipment and tools
- correctly disposing of hazardous waste.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that oxygen mask testing and inspection procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance and fitting procedures and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to recognise faults and damage and perform appropriate repairs that are within the bounds of the individual's authority, and through the demonstration of correct fitting procedures.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant enterprise procedures and maintenance publications
- WHS procedures relating to oxygen mask maintenance
- how to obtain MSDS
- safety precautions relating to oxygen and the operation of the oxygen test rig

- requirements for an oxygen mask servicing facility
- oxygen in flight
- components of an oxygen mask and their function
- oxygen mask operation in relation to flight
- oxygen regulator operation
- physiological effects of flight
- hypoxia
- critical nature of maintaining and fitting oxygen masks
- need to regularly assess correct fitment of oxygen masks
- oxygen mask fitting procedures
- fitting procedures relating to the fitment of oxygen masks to helmets
- G forces
- forces of ejection
- basic electrical principles
- environmental conditions that may affect oxygen equipment
- approved cleaning methods for aviation life support equipment
- handling, storage and transit procedures relating to life support equipment
- handling and storage procedures for oxygen masks
- types of corrosion and contamination that may affect oxygen masks
- modification requirements for oxygen masks
- oxygen mask repair procedures and limitations
- soldering techniques
- operation of testing and measuring equipment and tools used to maintain oxygen masks
- use and storage of adhesives.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on at least three (3) unserviceable oxygen masks providing a representative range of maintenance tasks and on the correct fitting of oxygen masks to at least three (3) individuals.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A505 Maintain and pack parachutes

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the maintenance and packing of parachutes. Maintenance involves inspection, testing, fault diagnosis, replacement of parts, completion of repairs and cleaning during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit applies to person carrying parachutes, including emergency and ejection parachutes. It also applies to ballistic parachutes used for the recovery of light aircraft.

This unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
ME A118	Conduct self in the aviation maintenance environment

MEA511	Operate and maintain sewing machines and overlockers
MSFSF2002	Machine sew materials

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Maintain parachute	1.1	Parachute is inspected for serviceability in accordance with standard procedures
	1.2	Parachute is tested for serviceability in accordance with standard procedures and manufacturer's specifications
	1.3	Identified faults beyond own authority to rectify are reported to supervisor and faulty parachute is quarantined
	1.4	Unserviceable parts of the parachute are replaced to render parachute serviceable in accordance with standard procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
	1.5	Basic parachute repairs are completed in accordance with standard procedures
	1.6	Parachute is cleaned in accordance with standard procedures
	1.7	Parachute is presented for inspection by supervisor in accordance with standard procedures
	1.8	Maintenance documentation is completed and processed in accordance with standard enterprise procedures
2. Pack parachute	2.1	Parachute is packed for use in accordance with standard

procedures

- 2.2 Parachute is presented for inspection by supervisor in accordance with standard enterprise procedures
- 2.3 Relevant documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Standard procedures are found in any or all of:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Australian Standards
- Equipment manufacturers' specifications and procedures
- Industry practices
- Safety manuals
- Maintenance schedules
- Work instructions
- Maintenance organisation manuals
- MSDS
- Defence regulations and instructions
- Civil Aviation Safety Regulations (CASRs) and advisory material
- Standing instructions
- Broken stitching
- Broken quick release fitting springs
- Contamination
- Corrosion of metal parts
- Damaged hardware
- Damaged quick release fitting screws
- Excessive wear
- Expired parachute components

Faults include:

Parts of the parachute include:

- Frayed lines
- Incorrect manufacture
- Pulled threads
- Incorrect rigging line sequence
- Seized quick release fitting lugs
- Stretched lines
- Tears in parachute
- Ultraviolet (UV) degradation
- Canopy
- Hardware (e.g. buckles, eyelets, connector links)
- Harness
- Parachute housing (e.g. pack)
- Quick release fitting
- Rigging lines

Basic parachute repairs include:

- Broken stitching
- Corrosion (e.g. fittings)
- Damaged hardware
- Frayed lines
- Pulled threads
- Tears in parachute

Unit Mapping Information

Release 1 – equivalent to MEA505A Maintain and pack parachutes

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA505 Maintain and pack parachutes

Modification History

Release 1 - New unit of competency

Performance Evidence

- Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:
- applying WHS practices relating to parachute maintenance processes, including the selection and correct use of PPE, where applicable
- handling, storing and organising transport of equipment
- delivering briefings to personnel in relation to operating parachutes
- using MSDS
- using maintenance publications, drawings and documentation relating to parachute maintenance
- using applicable testing and measuring equipment, tools and maintenance documentation to:
 - test parachutes for serviceability
 - replace unserviceable components in accordance with approved procedures
 - select and use appropriate parachute cleaning materials
 - repair parachutes (both hand and machine sewing)
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that parachute testing and inspection procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance and packing procedures and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to recognise faults, replace components and perform appropriate repairs that are within the bounds of the individual's authority, and through the demonstration of correct packing procedures.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications

- WHS procedures relating to parachute maintenance, including the selection and use of PPE
- how to obtain MSDS
- critical nature of maintaining and packing parachutes, i.e. risk of death
- approved cleaning methods for aviation life support equipment
- components of a parachute and their function
- parachute assembly materials of construction
- environmental conditions that may affect parachutes and parachute assemblies including ultraviolet degradation
- types of corrosion and contamination that may affect parachute assemblies
- handling, storage and transit procedures relating to parachutes
- physiological effects of flight
- sequence of ejection
- operation of person carrying parachutes
- operation of ballistic parachutes in aircraft recovery
- purpose of different types of canopies
- modification requirements for parachutes
- requirements for a parachute servicing facility
- operation of testing and measuring equipment and tools used to maintain parachutes
- repair limitations for parachutes
- packing tools and measuring equipment required to pack parachutes.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the following range of tasks:
 - correctly packing a minimum of three (3) parachutes consecutively and without the need for corrective action by the supervisor
 - recognising the limits of own authority
 - replacing canopy/harness, including line sequence tests
 - correctly repairing a tear in parachute canopy material through patching
 - inspecting, testing and replacing unserviceable parts of a quick release fitting
 - recognising a range of faults and their serviceability limits and repairing within limitations/tolerances.

- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA507 Maintain, pack and fit survival inflatable buoyancy vests

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the maintenance, packing and fitting of survival inflatable buoyancy vests. Maintenance includes inspecting, testing, isolating faults, replacing components and cleaning prior to packing, during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit does not include repairing buoyancy vests.

The Unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA118	Conduct self in the aviation maintenance environment

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Maintain survival inflatable buoyancy vests | 1.1 | Survival inflatable buoyancy vests and associated ancillary equipment are inspected for serviceability in accordance with standard procedures |
| | | 1.2 | Identified faults beyond own authority to rectify are reported to supervisor and faulty survival inflatable buoyancy vest and/or ancillary equipment is quarantined |
| | | 1.3 | Unserviceable parts of the survival inflatable buoyancy vest and/or ancillary equipment are replaced in accordance with standard procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.4 | Survival inflatable buoyancy vest is tested for serviceability in accordance with standard procedures and manufacturer's specifications |
| | | 1.5 | Survival inflatable buoyancy vest is cleaned in accordance with standard procedures |
| | | 1.6 | Survival inflatable buoyancy vest is presented for inspection by supervisor in accordance with standard procedures |
| | | 1.7 | Maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. | Pack survival inflatable buoyancy vests | 2.1 | Survival inflatable buoyancy vest is packed for use in accordance with standard procedures |
| | | 2.2 | Ancillary equipment is packed for use in accordance with standard procedures |
| | | 2.3 | Survival inflatable buoyancy vest is presented for inspection by supervisor in accordance with standard enterprise procedures |
| | | 2.4 | Relevant documentation is completed and processed in accordance with standard enterprise procedures |

3. Fit survival inflatable buoyancy vests
- 3.1 Fitting process is explained to the participant so that optimal fit can be achieved through relevant feedback
 - 3.2 Participant is measured to select appropriate size survival inflatable buoyancy vest
 - 3.3 Survival inflatable buoyancy vest is adjusted to optimise fit
 - 3.4 Survival inflatable buoyancy vest fit is verified through participant feedback and supervisor approval
 - 3.5 Relevant documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Applicable survival inflatable buoyancy vests include:

- Secumar AUS2

Ancillary equipment includes:

- Electronic locating devices
- Lighting devices
- Pyrotechnics
- Rations
- Survival/location aids
- Water

Standard procedures are found in any or all of:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Australian Standards
- Equipment manufacturers' specifications and procedures
- Industry practices
- Safety manuals

- Maintenance schedules
 - Work instructions
 - Maintenance organisation manuals
 - MSDS
 - Defence regulations and instructions
 - Civil Aviation Safety Regulations (CASRs) and advisory material
 - Standing instructions
- Faults include:**
- Abrasion
 - Broken stitching
 - Contamination
 - Corrosion of metal parts
 - Damaged hardware
 - Delamination/porosity
 - Expired components or equipment
 - Faulty valves
 - Frayed lines
 - Holes
 - Incorrect manufacture
 - Lifting tapes
 - Ultraviolet (UV) degradation
- Parts include:**
- Buoyancy chambers
 - Cylinders
 - Hardware
 - Operating head
 - Valves
 - Valise
 - Zippers
- Testing includes:**
- Checking ancillary equipment (e.g. electronic locating devices and survival/location aids)
 - Cylinder weight tolerance
 - Inflation tests
 - Light and battery test
- Adjustment to vest includes:**
- Breast height
 - Chest
 - Waist

Unit Mapping Information

Release 1 – equivalent to MEA507A Maintain, pack and fit survival inflatable buoyancy vests

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA507 Maintain, pack and fit survival inflatable buoyancy vests

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS practices relating to survival inflatable buoyancy vest maintenance processes, including the selection and correct use of PPE where applicable
- using MSDS
- using maintenance publications, drawings and documentation relating to survival inflatable buoyancy vests and ancillary equipment maintenance
- handling, storing and organising transport of equipment
- delivering briefings to personnel in relation to operating, donning/doffing and fitting of survival inflatable buoyancy vests
- inflating/deflating survival inflatable devices for maintenance
- using applicable testing and measuring equipment, tools and maintenance documentation to:
 - test survival inflatable buoyancy vests for serviceability
 - replace unserviceable components or items of ancillary equipment in accordance with approved procedures
 - select and use appropriate survival inflatable buoyancy vest cleaning materials
- soldering battery terminals on emergency locator transmitters
- tying various types of knots, including:
 - reef knot
 - bowline
 - thumb knot
 - half hitch
- hand sewing
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that survival inflatable device testing and inspection procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance, packing and fitting procedures and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to recognise faults and replace components that are within the bounds of the individual's authority, and through the demonstration of correct packing and fitting procedures. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- WHS procedures relating to survival inflatable buoyancy vest maintenance, including the selection and use of PPE
- how to obtain MSDS
- relevant safety precautions including storage and handling of compressed gas cylinders and survival and distress pyrotechnics
- critical nature of maintaining and packing survival inflation devices, i.e. risk of death
- search and rescue procedures
- Priorities of survival and how they relate to survival inflatable buoyancy vests and associated ancillary equipment
- electrical principles
- approved cleaning methods for aviation life support equipment
- environmental conditions that may affect survival inflation devices, including ultraviolet (UV) degradation
- types of corrosion and contamination that may affect survival inflation devices
- handling, storage and transit procedures relating to survival inflation devices
- survival inflation devices and methods of operation
- operation of emergency locator beacons and emergency locator transmitters
- principles of operation of inflation mechanisms
- components of a survival inflation device and their function
- repair limitations for survival inflatable buoyancy vests
- modification requirements for survival inflatable buoyancy vests
- requirements for a survival inflation device servicing facility
- packing tools and measuring equipment required to pack survival inflatable devices
- use of survival inflatable buoyancy vests, including associated ancillary equipment.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.

- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the following range of tasks:
 - completing a minimum of three (3) inflation tests without the need for corrective action by the supervisor
 - recognising the limits of own authority
 - testing cylinder weight and determining if it is within tolerance
 - correctly packing a minimum of three (3) survival inflatable buoyancy vests without the need for corrective action by the supervisor
 - correctly fitting survival inflatable buoyancy vests to a minimum of three (3) different people without supervisor intervention
 - recognising a range of faults and their serviceability limits (faults must include incorrect manufacture and verifying expiry date of inflatable buoyancy vest and ancillary equipment).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA508 Maintain, install and remove restraint systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the maintenance, installation and removal of personal restraint systems. Maintenance may be performed in-situ or in a maintenance workshop and involves inspection, fault diagnosis, replacement of parts, completion of repairs and cleaning during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit applies to a range of personal restraint systems.

The unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA118	Conduct self in the aviation maintenance environment
MEA511	Operate and maintain sewing and overlocking machines
MSFSF2002	Machine sew materials

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---------------------------------------|--|
| 1. Maintain restraint belts/harnesses | 1.1 Restraint belts/harnesses are inspected for serviceability in accordance with standard procedures |
| | 1.2 Identified faults beyond own authority to rectify are reported to supervisor and faulty restraint system is quarantined |
| | 1.3 Unserviceable parts of a quick release fitting are inspected, tested and replaced |
| | 1.4 Unserviceable parts of the restraint belts/harnesses are replaced to render restraint system serviceable in accordance with standard procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 1.5 Basic restraint belt/harness stitching repairs are completed in accordance with standard procedures |
| | 1.6 Restraint belts/harnesses are cleaned in accordance with standard procedures |
| | 1.7 Restraint belts/harnesses are presented for inspection by supervisor in accordance with standard procedures |
| | 1.8 Maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. Remove restraint systems | 2.1 Approval to remove restraint system is obtained in accordance with standard enterprise procedures |
| | 2.2 Restraint system is removed from the aircraft in |

- accordance with applicable maintenance publication
- 2.3 Maintenance documentation is completed and processed in accordance with standard enterprise procedures
3. Install restraint systems
- 3.1 Approval to fit restraint system is obtained in accordance with standard enterprise procedures
- 3.2 Restraint system is fitted to the aircraft in accordance with applicable maintenance publication
- 3.3 Maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Restraint belts/harnesses include:

- Fixed point attached harness
- Passenger restraint belts
- Retractable restraint harnesses (will be attached to inertia reel but the inertia reel does not form part of the restraint system)

Standard procedures are found in any or all of:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Australian Standards
- Equipment manufacturers' specifications and procedures
- Industry practices
- Safety manuals
- Maintenance schedules
- Work instructions
- Maintenance organisation manuals
- MSDS

Faults include:

- Defence regulations and instructions
- Civil Aviation Safety Regulations (CASRs) and advisory material
- Standing instructions
- Broken quick release fitting springs
- Broken stitching
- Contamination
- Corrosion of metal parts
- Damaged hardware
- Damaged quick release fitting screws
- Excessive wear
- Expired date of restraint components
- Incorrect manufacture
- Pulled threads
- Seized quick release fitting lugs
- Ultraviolet (UV) degradation

Parts include:

- Belt
- Fixed point attachment line
- Hardware (e.g. buckles)
- Harness
- Parachute housing (e.g. pack)
- Quick release fittings including lugs, springs and screws

Unit Mapping Information

Release 1 – equivalent to MEA508A Maintain, install and remove restraint systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA508 Maintain, install and remove restraint systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS practices relating to restraint system maintenance processes, including the selection and correct use of PPE, where applicable
- handling, storing and organising transport of equipment
- using MSDS
- using maintenance publications, drawings and documentation relating to restraint system maintenance
- using applicable testing and measuring equipment, tools and maintenance documentation to:
 - replace unserviceable components in accordance with approved procedures
 - select and use appropriate restraint system cleaning materials
 - repair restraint systems (both hand and machine sewing)
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that restraint system inspection procedures, cleanliness requirements, repair procedures and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance, installation and removal procedures and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to recognise faults, replace components and perform appropriate repairs that are within the bounds of the individual's authority, and through the demonstration of correct installation and removal procedures.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- WHS procedures relating to restraint system maintenance, including the selection and use of PPE
- how to obtain MSDS

- critical nature of maintaining and fitting restraint systems
- approved cleaning methods for aviation life support equipment
- components of a restraint system and their function
- flight line procedures
- ultraviolet (UV) degradation
- types of corrosion and contamination that may affect restraint systems
- handling, storage and transit procedures relating to life support equipment
- modification requirements for restraint systems
- operation of testing and measuring equipment and tools used to maintain restraint systems
- repair limitations for restraint systems.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the inspection, repair, installation and removal of restraint systems, including the demonstration of the ability to recognise a range of faults and their serviceability and repair limitations/tolerances (must include verification of expiry dates of restraint system component parts and recognition of incorrect manufacture).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA509 Manufacture, repair and alter aircraft related fabric components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the manufacture, repair and alteration of aircraft and support equipment fabric components. Manufacture and alteration may be to existing designs or may also involve design. Repair may involve sewing and/or the use of adhesives.

The unit applies to a range of aircraft environmental protection sets, aircraft life support equipment components, aircraft soft furnishings and associated trimming, aircrew personal fit and associated life support equipment, and to ground support equipment covers.

The unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA118	Conduct self in the aviation maintenance environment
MEA511	Operate and maintain sewing and overlocking machines
MSFSF2002	Machine sew materials

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Manufacture a fabric component	1.1	Technical instructions are identified and interpreted to ensure compliance in accordance with standard procedures
	1.2	Detailed working plan is produced in accordance with standard procedures
	1.3	Fabric component is assembled and fittings are attached in accordance with standard procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
	1.4	Aircraft related fabric components are presented for inspection by supervisor in accordance with standard enterprise procedures
	1.5	Relevant documentation is completed and processed in accordance with standard enterprise procedures
2. Repair a fabric component	2.1	Technical instructions are identified and interpreted to ensure faults are corrected in accordance with standard procedures
	2.2	Fabric component is repaired in accordance with standard procedures while observing all relevant WHS requirements, including the use of MSDS and items of PPE
	2.3	Repaired components are presented for inspection by supervisor in accordance with standard enterprise procedures

- | | | | |
|----|--|-----|--|
| 3. | Alter a fabric component to meet customer requirements | 2.4 | Relevant documentation is completed in accordance with standard enterprise procedures |
| | | 3.1 | Customer is consulted to establish the requirements to alter the fabric component and to ensure defined outcomes are met |
| | | 3.2 | Identified alterations beyond own authority to alter are reported to supervisor |
| | | 3.3 | A detailed working plan is produced, where necessary, in accordance with standard procedures |
| | | 3.4 | Altered fabric components are presented for inspection by supervisor in accordance with standard enterprise procedures |
| | | 3.5 | Relevant documentation is completed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Fabric components include:

- Aircraft environmental protection sets and warning devices
- Aircraft life support equipment components
- Aircraft soft furnishings and associated trimming
- Aircrew personal fit and associated life support equipment
- Ground support equipment covers
- Aircraft operational requirements
- Job orders

Technical instructions

- include:**
- Manufacturers' specifications
 - Maintenance manuals
 - Modification instructions
 - Technical drawings
- Standard procedures are found in any or all of:**
- Commonwealth/state/territory WHS legislation, regulations and codes
 - Australian Standards
 - Equipment manufacturers' specifications and procedures
 - Industry practices
 - Safety manuals
 - Maintenance schedules
 - Work instructions
 - Maintenance organisation manuals
 - MSDS
 - Defence regulations and instructions
 - Civil Aviation Safety Regulations (CASRs) and advisory material
 - Standing instructions
- Detailed working plan includes:**
- Cutting plan
 - Expected time of completion
 - Manpower requirements
 - Method and sequence of assembly
 - Resource requirements (material, fittings, tools and ground support equipment)
 - Technical sketch (working drawing)
- Assembly of fabric components and attachment of fittings includes:**
- Adhering
 - Hand sewing
 - Machine sewing
 - Press fitting
 - Stapling
- Faults include:**
- Broken stitching
 - Broken zippers
 - Contamination
 - Corrosion of metal parts
 - Damaged fittings
 - Excessive wear
 - Incorrect manufacture
 - Tears in fabric
 - Ultraviolet (UV) degradation
- Customers include:**
- Aircraft configuration authorities
 - Aircrew
 - Engineering maintenance managers

- Defined outcomes include:**
- Supervisors
 - Effect on fit of fabric components
 - Effect on performance of altered fabric components
 - Availability of resources
 - Expected time of completion

Unit Mapping Information

Release 1 – equivalent to MEA509A Manufacture, repair and alter aircraft related fabric components

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA509 Manufacture, repair and alter aircraft related fabric components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS practices relating to fabric component manufacture, repair and alteration, including the selection and correct use of PPE, where applicable
- handling, storing and organising transport of equipment
- using MSDS
- using maintenance publications, drawings and documentation relating to fabric component manufacture, repair and alterations
- applying basic sewing techniques associated with the manufacture, repair and alteration of aircraft fabric components
- using hand sewing techniques
- using basic drawing tools
- calculating dimension and allowable dimension variations
- completing measurements and estimating fabric requirements and other material requirements
- using pre-checking and inspection techniques to anticipate cutting problems and to avoid reworking and wastage
- using relevant hand and power tools
- using the limited workplace technology related to cutting, including tools, equipment, calculators and measuring devices
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that fabric component manufacture, repair and alteration procedures and safety precautions are fully observed, understood and complied with. Ability to interpret fabric component requirements and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to perform appropriate manufacturing, repair and alteration tasks that are within the bounds of the individual's authority.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- WHS procedures relating to fabric component manufacture, repair and alteration, including the selection and use of PPE
- how to obtain MSDS
- basic sewing techniques using *AS 2860-1986 Textiles – stitch types – classification and terminology*
- construction principles of fabric components
- cutting equipment and techniques
- design features of finished items
- fabric types, common faults and inspection procedures
- impact of cutting on fabrics
- geometric drawing processes and techniques
- reading and interpreting specifications
- types of corrosion and contamination that may affect aircraft fabric components.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the following tasks:
 - recognising the limits of own authority
 - correctly manufacture three fabric components from technical instructions using machine sewing and at least one other assembly method (hand sew, press fit, adhere or staple)
 - recognising at least three faults and identifying limits of repair for the fabric components
 - altering a fabric component to meet customer requirements.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA510 Maintain seat and pod electrical and electronic systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills in the scheduled or unscheduled removal and installation of electrical and electronic system components during the overhaul of aircraft seats and pods, and the use of basic electrical test equipment and in-flight entertainment system test sets to perform functional tests and confirm system serviceability.

This unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA240 Use electrical test equipment to perform basic electrical tests

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Remove and inspect seat and pod electrical system components | 1.1 | System is rendered safe and prepared in accordance with the applicable maintenance manual to ensure personnel safety |
| | | 1.2 | Removal of electrical system components is carried out in accordance with the applicable maintenance manual while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of |

- personal protective equipment (PPE)
- 1.3 Removed components are inspected for visible signs of damage or deterioration in accordance with maintenance manuals and standard enterprise procedures
 - 1.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 1.5 Removed components are tagged, packaged or discarded in accordance with specified procedures
2. Remove and inspect seat and pod electronic system components
- 2.1 System is rendered safe and prepared in accordance with the applicable maintenance manual to ensure personnel safety
 - 2.2 Removal of electronic system components is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements, including the use of MSDS and items of PPE
 - 2.3 Removed components are inspected for visible signs of damage or deterioration in accordance with maintenance manuals and standard enterprise procedures
 - 2.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 - 2.5 Removed components are tagged, packaged or discarded in accordance with specified procedures
3. Install seat and pod electrical system components
- 3.1 Electrical system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
 - 3.2 Physical installation of electrical components is carried out in accordance with the applicable maintenance manual
 - 3.3 System is reinstated to correct physical condition in preparation for testing
 - 3.4 Required maintenance documentation is completed and processed in accordance with standard enterprise

- procedures
4. Install seat and pod electronic system components
 - 4.1 Electronic system components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
 - 4.2 Physical installation of electronic components is carried out in accordance with the applicable maintenance manual
 - 4.3 System is reinstated to correct physical condition in preparation for testing
 - 4.4 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
 5. Functionally test seat and pod electrical and electronic systems
 - 5.1 Applicable system test set is connected to seat or pod in accordance with the applicable maintenance manual or approved vendor procedures
 - 5.2 Power is applied to the seat or pod in accordance with applicable maintenance manual
 - 5.3 Seat or pod electrical system is functionally tested for correct operation in accordance with the applicable maintenance manual
 - 5.4 Seat or pod electronic system is functionally tested using the applicable test set in accordance with the applicable maintenance manual
 - 5.5 Test equipment is removed and required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Removal and installation of electrical components involves one or more of the following connection methods:

- Bolted
- Plug connectors

Electrical system components include:

- Electrical cables and looms
- Selectors and switches
- Motors and actuators
- Relays, control units and modules

Electronic system components include:

- Display units
- Tuners/selectors
- Volume controls
- Audio headset receptacles
- Data cables

Visible signs of damage or deterioration include:

- Broken or chafed wires
- Corrosion of plugs and connectors
- Physical damage to components
- Wear
- Evidence of electrical or electronic component overheating

Unit Mapping Information

Release 1 – equivalent to MEA510A Maintain seat and pod electrical and electronic systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA510 Maintain seat and pod electrical and electronic systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices, including the use of PPE and MSDS
- using approved maintenance documentation and aircraft publications relating to aircraft seat and pod electrical and electronic systems and components
- recognising defects in and deterioration of electrical cables to aircraft industry standards, including crimped and soldered joints
- correctly interpreting aircraft wire markings, terminal block identification and plug/socket pin numbering systems
- inspecting electrical looms and harness pre and post-removal and installation to ensure minimum bends are maintained, cable is not in tension, plugs are correctly aligned, security of route ensures no chaffing of insulation, adequate clipping and cable ties have been utilised and construction complies with aircraft industry standards
- positively identifying seat and pod electrical and electronic system components
- plug connector pin removal and insertion where soldering is not required
- recognising damage and visual defects in electrical components, such as actuators, motors and switches
- recognising damage and visual defects in electronic system components, such as display screens, tuners, volume controls, audio headset receptacles and data cables.

It is essential that applicable cleanliness requirements and WHS precautions are fully observed, including awareness of electrostatic discharge procedures.

Evidence of transferability of skills and knowledge related to removal and installation is essential.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant WHS procedures
- how to obtain relevant MSDS
- the use of applicable items of PPE

- component attachment methods
- connection of hardware and plugs
- electrical wiring used in aircraft and wire marking
- plug/socket pin numbering and terminal block identification
- cable and loom installation requirements, including bonding and screening
- crimping tools and crimp terminals
- procedures for removal and insertion of plug connector pins where soldering is not required
- handling and maintenance precautions relating to electronic displays and electrostatic sensitive devices
- electromagnetic environment
- data cable installation requirements.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in maintenance manuals. It is also expected that general-purpose tools, test and ground support equipment found in most routine situations would be used where appropriate.
- An understanding of the attachment methods, connection of hardware and system operation as they relate to the work must be demonstrated before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved on the range of components and tasks listed in the Range of Conditions.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA511 Operate and maintain sewing machines and overlockers

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the operation and maintenance of sewing machines and overlockers in the maintenance of items of aircraft life support equipment and in the fabrication and maintenance of items of aircraft soft furnishings.

The unit is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways. It is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---------------------------------|-----|--|
| 1. | Plan work and prepare work area | 1.1 | Work is planned to maximise safety and productivity |
| | | 1.2 | Work area is cleared and cleaned to provide work table free of obstructions and clear access to sewing/overlocking machine |
| | | 1.3 | Safe working environment is established |
| | | 1.4 | Suitable electrical power outlets, if required, are identified |
| | | 1.5 | Assistance to move and position work piece is |

- obtained if necessary
2. Select thread and needle
 - 2.1 Type of material to be sewn, type of stitch to be used and nature of duty to which finished product is to be subjected is determined to assist in selection of thread and needle
 - 2.2 Suitable thread is selected with regard to thread material, diameter of thread, tensile strength and colour
 - 2.3 Appropriate needle is chosen to suit type of thread, type of stitch and material to be sewn
 3. Set up machine
 - 3.1 Machine is examined for damage, missing components or other defects
 - 3.2 Power cords are examined for knots, unsafe routing and insulation damage
 - 3.3 Machine is safely connected to power and correct 'power-on' procedure is followed
 - 3.4 Condition of needle is checked to ensure it is sharp, clean and free from rust and dirt
 - 3.5 Needle is fitted to machine
 - 3.6 Machine is threaded and thread is checked for free travel from spool
 - 3.7 Thread tension and other machine settings are checked and adjusted using test pieces if necessary
 4. Operate machine
 - 4.1 Work piece is correctly aligned to machine
 - 4.2 Machine is operated in accordance with standard procedures while observing all relevant work health and safety (WHS) requirements
 - 4.3 Work piece is appropriately fed into machine
 - 4.4 Performance of machine is monitored through regular checking of thread tension and other settings and inspection of stitching in finished product
 5. Inspection, quality, labelling and documentation
 - 5.1 Work piece is removed from machine using assistance if necessary
 - 5.2 Completed work is inspected to verify that it meets

		applicable technical instructions
	5.3	Any areas in need of rework or rectification are identified and marked
	5.4	Rework is performed or other appropriate action arranged
	5.5	Completed product is labelled or tagged and any necessary documentation completed in accordance with standard enterprise procedures
6.	Clean up and maintain equipment	6.1 Machine is switched off using correct 'power off' procedures
		6.2 Machine is cleaned and programmed maintenance, which is within the province of the operator, is performed in accordance with enterprise requirements and manufacturer's specifications while observing all relevant WHS requirements, including the use of material safety data sheets (MSDS)
		6.3 Worn or damaged needles are disposed of in accordance with safe working practice
		6.4 Supervisor is notified of any abnormal conditions requiring maintenance or repair

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Working environment includes:

- Work organisation procedures and practices relating to the sewing/overlocking of materials
- Safe use of sewing/overlocking machines and relevant

hand and power tools

- Storage, safe handling and disposal of needles, threads and materials associated with sewing/overlocking
- Reporting actions which include verbal and written communication in accordance with enterprise policies and procedures
- Oral, written or visual communication, including completion of standard forms, interpretation of information and instructions associated with workplace activities, and recording and reporting of work outcomes
- Procedures for safety, environmental protection, housekeeping and quality as specified by equipment and materials manufacturers, regulatory authorities and the enterprise

Standard procedures are found in any or all of:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Australian Standards
- equipment manufacturers' specifications and procedures
- Industry practices
- Safety manual
- Maintenance schedules
- Work instructions
- Maintenance organisation manual
- MSDS
- Defence regulations and instructions
- Civil Aviation Safety Regulations (CASRs) and advisory material
- Standing instructions

Technical instructions include:

- Aircraft operational requirements
- Job orders
- Manufacturers' specifications
- Maintenance manuals
- Modification instructions
- Technical drawings

Unit Mapping Information

Release 1 – equivalent to MEA511A Operate and maintain sewing machines and overlockers

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA511 Operate and maintain sewing machines and overlockers

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures
- interpreting and applying work instructions and established procedures
- planning and coordinating work activities
- locating and interpreting technical information about machines and materials used in aircraft life support and furnishing
- selecting appropriate needle and thread
- identifying unsatisfactory machine performance
- using relevant hand and power tools
- using relevant chemicals and cleaning agents and dispose of waste products
- maintaining machines and work area
- applying all relevant safety practices
- communicating effectively within the workplace
- documenting and transferring information.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities involving the use of sewing machines/overlockers. It is essential that fabric component manufacture, repair and alteration procedures and safety precautions are fully observed, understood and complied with. Ability to interpret fabric component requirements and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to perform appropriate manufacturing, repair and alteration tasks that are within the bounds of the individual's authority.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- precautions and safe working practices based on relevant WHS legislation, codes of practice, policies and procedures
- advanced work piece construction principles and methods
- characteristics of a wide range of materials used in aircraft life support and furnishing

- operating principles of a wide range of sewing/overlocking machines
- types of needles and threads and their applications
- types of stitching and their applications
- standard industry practice for needle storage and safe disposal
- the range of sewing/overlocking machines, hand tools and power tools used in sewing/overlocking processes and their appropriateness for particular applications
- relevant quality standards for sewn/overlocked products
- power sources, such as single phase, three phase and weather protected outlets
- electrical isolation procedures for sewing/overlocking machines
- safety and environmental requirements of relevant industry and enterprise procedures
- general housekeeping policies and procedures
- recording and reporting procedures.
-

Assessment Conditions

- Access is required to:
 - real or appropriately simulated situations involving the sewing or overlocking of materials used in aircraft life support equipment and in aircraft soft furnishings
 - information on specifications of materials used in sewing and overlocking, settings for machines, relevant safety procedures and regulations, quality standards, and enterprise procedures
 - all necessary facilities, sewing/overlocking machines and associated hand and power tools.
- Assessment may occur on the job or in an industry approved simulated environment.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a sufficient number of occasions or over sufficient period of time to ensure consistent performance across a typical range of sewing and overlocking requirements performed at the enterprise.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA512 Maintain general aviation recovery devices with ballistic parachute systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency is required by individuals seeking approval within Civil Aviation Safety Regulation (CASR) Part 145 and Civil Aviation Regulation (CAR) 30 maintenance organisations to maintain general aviation recovery devices that have ballistic parachute systems. Coverage does not include the maintenance and re-packing of the parachute which is covered by unit MEA505 Maintain and pack parachutes.

The unit requires the application of hand skills and knowledge of general aviation recovery devices (GARD) with ballistic parachute systems to remove, install and maintain the system when fitted to small aircraft.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
DEFEO101D	Work safely with explosive ordnance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes	Performance criteria describe the performance needed to demonstrate achievement of the element
1. Inspect GARD ballistic parachute system	<p>1.1 Ballistic parachute container is inspected in accordance with applicable maintenance data</p> <p>1.2 Parachute deployment rocket and operating cable is inspected in accordance with applicable maintenance data while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)</p> <p>1.3 Remaining installed life is verified from aircraft documentation</p> <p>1.4 Maintenance documentation is completed in accordance with standard enterprise procedures</p>
2. Remove GARD ballistic parachute system	<p>2.1 Operating cable is disconnected and rocket is removed in accordance with applicable maintenance data and explosives handling safety precautions</p> <p>2.2 Parachute container is removed from the aircraft in accordance with applicable maintenance data while observing all relevant WHS requirements, including the use of MSDS and items of PPE</p> <p>2.3 Maintenance documentation is completed in accordance with standard enterprise procedures</p>
3. Install GARD ballistic parachute system	<p>3.1 Parachute container is installed in accordance with applicable maintenance data</p> <p>3.2 Rocket is fitted and operating cable connected in accordance with applicable maintenance data and explosives handling safety precautions</p> <p>3.3 Maintenance documentation is completed in accordance with standard enterprise procedures</p>

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Maintenance data includes:**
- Aircraft maintenance manuals
 - Manufacturer maintenance manuals
 - Regulatory requirements
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

New unit of competency

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA512 Maintain general aviation recovery devices with ballistic parachute systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying hand skills and using maintenance data to inspect ballistic parachute systems
- using aircraft maintenance records to confirm the remaining installed life of ballistic parachute systems
- observing explosive ordnance handling safety precautions and maintenance data to:
 - disconnect the rocket and remove the ballistic parachute system
 - install the ballistic parachute system and connect the operating cable to the rocket.

It is essential that the relevant procedures are interpreted and applied to ensure quality and safety standards are achieved.

Evidence of transferability of skills and knowledge related to maintenance is essential. This shall be demonstrated through application across a number of ballistic parachute systems.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- ballistic parachute:
 - operation
 - hazards and safety precautions
 - parachute and rocket installed lives
 - maintenance data
- completion of an approved GARD system maintenance course that includes coverage of ballistic parachute systems.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that general-purpose tools and test equipment found in most routine situations would be used where appropriate.

- Ability to assess system serviceability and interpret remaining installed life will be necessary before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of CASA and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that an approved maintenance course has been successfully completed and the relevant elements and the performance criteria of the unit of competency are being achieved under routine supervision on the ballistic parachute systems maintained by the organisation.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- CAO 100.5 requires that training be delivered in the form of a maintenance course approved by a CAR 30 or CASR Part 145 maintenance organisation. Evidence of course completion forms part of the assessment criteria.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA513 Maintain and pack survival inflatable life rafts

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the maintenance and packing of survival inflatable life rafts. Maintenance involves inspection, testing, fault diagnosis, replacement of parts and cleaning during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit does not include repairing life rafts.

The unit applies to a range of types of survival inflatable life raft and is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA118	Conduct self in the aviation maintenance environment

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|---|
| 1. | Maintain survival inflatable life raft | 1.1 | Survival inflatable life raft and associated ancillary equipment is inspected for serviceability in accordance with standard procedures |
| | | 1.2 | Identified faults beyond own authority to rectify are reported to supervisor and faulty survival inflatable life raft, ancillary equipment is quarantined |
| | | 1.3 | Unserviceable parts of the survival inflatable life raft and ancillary equipment items are replaced in accordance with standard procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.4 | Survival inflatable life raft is tested for serviceability in accordance with standard procedures and manufacturer's specifications |
| | | 1.5 | Survival inflatable life raft is cleaned in accordance with standard procedures |
| | | 1.6 | Survival inflatable life raft is presented for inspection by supervisor in accordance with standard procedures |
| | | 1.7 | Maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. | Pack survival inflatable life raft | 2.1 | Survival inflatable life raft is packed for use in accordance with standard procedures |
| | | 2.2 | Ancillary equipment is packed for use in accordance with standard procedures |

- 2.3 Survival inflatable life raft is presented for inspection by supervisor in accordance with standard enterprise procedures
- 2.4 Relevant documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Applicable types of survival inflatable life rafts include:

- 10U Mk8
- F2B
- LRU 16

Ancillary equipment includes:

- Electronic locating devices
- Lighting devices
- Pyrotechnics
- Rations
- Survival/location aids
- Water

Standard procedures are found in any or all of:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Australian Standards
- equipment manufacturers' specifications and procedures
- Industry practices
- Safety manuals
- Maintenance schedules
- Work instructions
- Maintenance organisation manuals
- MSDS
- Defence regulations and instructions
- Civil Aviation Safety Regulations (CASRs) and advisory material
- Standing instructions

Faults include:

- Abrasion
- Broken stitching
- Contamination
- Corrosion of metal parts
- Damaged hardware
- Delamination/porosity
- Expired components or equipment
- Faulty valves
- Frayed lines
- Holes
- Incorrect manufacture
- Lifting tapes
- Ultraviolet (UV) degradation

Parts include:

- Cylinders
- Operating head
- Valves
- Valise

Testing includes:

- Checking ancillary equipment (e.g. electronic locating devices, survival/location aids)
- Cylinder weight tolerance
- Inflation tests
- Light and battery test

Unit Mapping Information

Release 1 – equivalent to MEA506A Maintain and pack survival inflatable life rafts and escape slides with regard to survival inflatable life rafts

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA513 Maintain and pack survival inflatable life rafts

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS practices relating to survival inflatable life raft and ancillary equipment maintenance processes, including the selection and correct use of PPE, where applicable
- using MSDS
- using maintenance publications, drawings and documentation relating to survival inflatable life raft and ancillary equipment maintenance
- handling, storing and organising transport of equipment
- delivering briefings to personnel in relation to operating survival inflatable life rafts
- inflating/deflating survival inflatable devices for maintenance
- using applicable testing and measuring equipment, tools and maintenance documentation to:
 - test survival inflatable devices for serviceability
 - replace unserviceable components or items of ancillary equipment in accordance with approved procedures
 - select and use appropriate survival inflatable device cleaning materials
- soldering battery terminals on emergency locator transmitters
- tying various types of knots, including:
 - reef knot
 - bowline
 - thumb knot
 - half hitch
- hand sewing
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that survival inflatable device testing and inspection procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance and packing procedures and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to recognise faults and replace components that are within the bounds of the individual's authority, and through the demonstration of correct packing procedures.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- WHS procedures relating to survival inflatable life raft maintenance including the selection and use of PPE
- how to obtain MSDS
- relevant safety precautions, including storage and handling of compressed gas cylinders and survival and distress pyrotechnics
- critical nature of maintaining and packing survival inflation devices, i.e. risk of death
- search and rescue procedures
- priorities of survival and how they relate to survival inflatable life rafts and associated ancillary equipment
- electrical principles
- approved cleaning methods for aviation life support equipment
- environmental conditions that may affect survival inflation devices, including UV degradation
- types of corrosion and contamination that may affect survival inflation devices
- handling, storage and transit procedures relating to survival inflation devices
- survival inflation devices and methods of operation
- operation of emergency locator beacons and emergency locator transmitters
- principles of operation of inflation mechanisms
- components of a survival inflation device and their function
- repair limitations for survival inflatable life rafts
- modification requirements for survival inflatable life rafts
- requirements for a survival inflation device servicing facility
- packing tools and measuring equipment required to pack survival inflatable devices
- use of survival inflatable life rafts, including associated ancillary equipment.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.

- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the following range of tasks:
 - completing a minimum of three (3) inflation tests without the need for corrective action by the supervisor
 - recognising the limits of own authority
 - testing cylinder weight and determining if it is within tolerance
 - correctly packing a minimum of three (3) survival inflatable life rafts or escape slides without the need for corrective action by the supervisor
 - recognising a range of faults and their serviceability limits (faults must include incorrect manufacture and verifying expiry date of inflatable life raft and ancillary equipment or escape slide).
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA514 Maintain and pack escape slides

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of skills and knowledge relating to the maintenance and packing of escape slides. Maintenance involves inspection, testing, fault diagnosis, replacement of parts and cleaning during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit does not include repairing escape slides.

The unit applies to a number of types of inflatable aircraft escape slides and is part of the Aeroskills Life Support and Furnishing Certificate III and IV training pathways.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activity
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA118	Conduct self in the aviation maintenance environment

Competency Field

Aircraft life support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|-----------------------|-----|--|
| 1. | Maintain escape slide | 1.1 | Escape slide is inspected for serviceability in accordance with standard procedures |
| | | 1.2 | Identified faults beyond own authority to rectify are reported to supervisor and faulty escape slide is quarantined |
| | | 1.3 | Unserviceable parts of the escape slide are replaced in accordance with standard procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | | 1.4 | Escape slide is tested for serviceability in accordance with standard procedures and manufacturer's specifications |
| | | 1.5 | Escape slide is cleaned in accordance with standard procedures |
| | | 1.6 | Escape slide is presented for inspection by supervisor in accordance with standard procedures |
| | | 1.7 | Maintenance documentation is completed and processed in accordance with standard enterprise procedures |
| 2. | Pack escape slide | 2.1 | Escape slide is packed for use in accordance with standard procedures |
| | | 2.2 | Escape slide is presented for inspection by supervisor in accordance with standard enterprise procedures |
| | | 2.3 | Relevant documentation is completed and processed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Applicable types of escape slides include:

- 19D22454-2
- 19D22387-2
- 19D22454-5
- 19D22454-6

Standard procedures are found in any or all of:

- Commonwealth/state/territory WHS legislation, regulations and codes
- Australian Standards
- Equipment manufacturers' specifications and procedures
- Industry practices
- Safety manual
- Maintenance schedules
- Work instructions
- Maintenance organisation manual
- MSDS
- Defence regulations and instructions
- Civil Aviation Safety Regulations (CASRs) and advisory material
- Standing instructions

Faults include:

- Abrasion
- Broken stitching
- Contamination
- Corrosion of metal parts
- Damaged hardware
- Delamination/porosity
- Expired components or equipment
- Faulty valves
- Frayed lines
- Holes

- Incorrect manufacture
 - Lifting tapes
 - Ultraviolet (UV) degradation
- Parts include:**
- Cylinders
 - Operating head
 - Valves
 - Valise
- Testing includes:**
- Cylinder weight tolerance
 - Inflation tests

Unit Mapping Information

Release 1 – equivalent to MEA506A Maintain and pack survival inflatable life rafts and escape slides with regard to escape slides

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA514 Maintain and pack escape slides

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying WHS practices relating to escape slide maintenance processes, including the selection and correct use of PPE, where applicable
- using MSDS
- using maintenance publications, drawings and documentation relating to escape slide maintenance
- handling, storing and organising transport of equipment
- delivering briefings to personnel in relation to operating escape slides
- inflating/deflating escape slides for maintenance
- using applicable testing and measuring equipment, tools and maintenance documentation.
- tying various types of knots, including:
 - reef knot
 - bowline
 - thumb knot
 - half hitch
- hand sewing
- cleaning and maintenance of equipment and tools.

The underlying skills inherent in this unit should be transferable across a range of aircraft life support equipment maintenance activities. It is essential that escape slide testing and inspection procedures, cleanliness requirements and safety precautions are fully observed, understood and complied with. Ability to interpret maintenance and packing procedures and apply them in practice is critical.

This is to be demonstrated through demonstration of the ability to recognise faults and replace components that are within the bounds of the individual's authority, and through the demonstration of correct packing procedures.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- relevant regulations, standards, enterprise procedures and maintenance publications
- WHS procedures relating to survival inflatable life raft and escape slide maintenance, including the selection and use of PPE
- how to obtain MSDS
- relevant safety precautions including storage and handling of compressed gas cylinders
- critical nature of maintaining and packing survival inflation devices, i.e. risk of death
- search and rescue procedures
- approved cleaning methods for aviation life support equipment
- environmental conditions that may affect survival inflation devices, including UV degradation
- types of corrosion and contamination that may affect survival inflation devices
- handling, storage and transit procedures relating to survival inflation devices
- survival inflation devices and methods of operation
- principles of operation of inflation mechanisms
- components of an escape slide and their function
- repair limitations for escape slides
- modification requirements for escape slides
- requirements for a survival inflation device servicing facility
- packing tools and measuring equipment required to pack survival inflatable devices
- use of escape slides.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on the following range of tasks:
 - completing a minimum of three (3) inflation tests without the need for corrective action by the supervisor
 - recognising the limits of own authority
 - testing cylinder weight and determining if it is within tolerance
 - correctly packing a minimum of three (3) escape slides without the need for corrective action by the supervisor
 - recognising a range of faults and their serviceability limits (faults must include incorrect manufacture and verifying expiry date of escape slide.

- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A601 Maintain aircraft egress systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency covers the maintenance of aircraft egress systems that contain explosive ordnance.

Maintenance covers the entire egress system, including the explosive ordnance. It involves the installation and removal of safety devices, disarming and rearming, inspecting, testing, replacing parts, cleaning and painting during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit is part of the Aeroskills Aircraft Armament Certificate IV training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence

Pre-requisite Unit

ME A101	Interpret work health and safety practices in aviation maintenance
ME A103	Plan and organise aviation maintenance work activity
ME A105	Apply quality standards applicable to aviation maintenance processes
ME A107	Interpret and use aviation maintenance industry manuals and specifications
ME A108	Complete aviation maintenance industry documentation
ME A109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
DEFEO101D	Work safely with explosive ordnance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.	Fit and remove safety devices	1.1	Safety devices are fitted to aircraft egress systems in accordance with standard operating and maintenance procedures
		1.2	Safety devices are removed from aircraft egress systems and are correctly stowed in accordance with standard operating and maintenance procedures
2.	Prepare for aircraft egress system maintenance	2.1	Applicable maintenance documentation is identified and obtained
		2.2	Aircraft egress system maintenance requirements are identified from applicable documentation
		2.3	Special tools and equipment required for the maintenance tasks are obtained and positioned
3.	Inspect, test and maintain aircraft egress systems	3.1	Aircraft egress systems are inspected in accordance with applicable maintenance documentation
		3.2	Relevant tests are safely conducted and results are recorded in accordance with standard enterprise procedures
		3.3	Required maintenance tasks are performed in accordance with applicable maintenance documentation and standard enterprise procedures while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
		3.4	Emergency and contingency procedures are performed as required

- | | | |
|--|-----|---|
| 4. Remove and install aircraft egress system components | 4.1 | Non-explosive egress system components are removed and installed in accordance with applicable maintenance documentation and standard enterprise procedures while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 4.2 | Explosive egress system components are removed and installed in accordance with applicable maintenance documentation and standard enterprise procedures while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| 5. Complete aircraft egress system maintenance operation | 5.1 | Removed non-explosive components are tagged and packaged for transportation in accordance with standard enterprise procedures |
| | 5.2 | Removed explosive components are tagged and packaged in accordance with procedures for packaging and transportation of explosive ordnance/dangerous goods |
| | 5.3 | Special tools and equipment are maintained in accordance with standard enterprise procedures |
| | 5.4 | Documentation and records are completed in accordance with standard enterprise procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Applicable maintenance documentation includes:

- Defect reports
- Maintenance releases containing details of unserviceabilities
- Modification orders or leaflets
- Service bulletins

- Instructions issued by airworthiness authorities
 - Work instructions
 - Servicing schedules
 - Maintenance manuals
 - Standards and drawings
 - Applicable airworthiness and explosive ordnance regulations
 - Standing instructions
 - Quality manuals
 - Safety manuals
 - Maintenance and explosives records
 - Arming and de-arming
 - Cleaning
 - Component changes
 - Painting
 - Non-explosive components:
 - barometric and gravitational sensing components
 - canopy jettison components
 - catapults
 - ejection seat railings and guns
 - inertia reels
 - parachute assemblies
 - pressure source bottles
 - survival equipment
 - Explosive components:
 - ejection handles
 - ejection seat cartridges and initiators
 - explosive connectors
 - explosive delay elements
 - flexible linear shaped charges
 - rocket motors
 - shielded mild detonating cord
 - special function cartridges
 - Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise
- Required maintenance tasks include:**
- Egress system components include:**
- Procedures and requirements include:**

Unit Mapping Information

Release 1 – equivalent to MEA601A Maintain aircraft egress systems

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA601 Maintain aircraft egress systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS procedures, including selection and use of PPE
- using MSDS
- fitment of applicable safety devices
- egress system disarming and rearming
- safely handling explosive components
- conducting tests involving continuity, gauging and measuring
- identifying and selecting applicable items of specialist equipment and tools
- using maintenance documentation, hand tools, specialist tools and equipment to perform egress system maintenance tasks
- preparing removed explosive components for safe storage or transportation.

It is essential that assessment confirms the ability to comply with organisational safety requirements and appropriate legislative and regulatory requirements while maintaining aircraft egress systems. The ability to work safely within an explosive ordnance environment, conduct applicable tests and maintain relevant documentation is critical.

This is to be established through demonstration of the ability to:

- render the system safe
- perform relevant inspections and tests, replace components (including disarming and re-arming the system)
- perform appropriate maintenance tasks.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- egress system construction, layout and operation
- operation, characteristics and limitations of aircraft egress systems
- effect of environmental conditions
- colour coding, marking and labels associated with egress systems
- operation, characteristics and limitations of specialist tools and equipment

- egress system test procedures
- safety precautions associated with explosive components
- requirements for handling and disposal of explosive components
- general WHS procedures applicable to egress system maintenance, including applicable PPE
- MSDS.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- Access will also be required to facilities and resources used in the storage, distribution or maintenance of explosive ordnance, including a licensed explosive site.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a range of tasks that is representative of the maintenance tasks, tests and the range of non-explosive and explosive components listed in the Range of Conditions.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA602 Remove and install aircraft stores management system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to members of the Australian Defence Force (ADF) who are required to apply explosive ordnance safety and handling procedures, hand skills and use maintenance documentation/publications in the removal and installation of stores management system (SMS) components to meet system reconfiguration requirements during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit applies to all aircraft with stores management systems.

The unit is part of the Armament Certificate IV training pathway.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
DEFEO101D	Work safely with explosive ordnance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.	Prepare aircraft for SMS reconfiguration	1.1	SMS reconfiguration task is verified from applicable documentation
		1.2	Aircraft safety devices are checked in accordance with relevant technical publications and manuals
		1.3	Correct SMS component is visually identified for reconfiguration
		1.4	Appropriate tools and ground support equipment are selected in accordance with the task
2.	Remove SMS component	2.1	Firing devices are checked and removed if fitted
		2.2	SMS component is removed from aircraft in accordance with technical publications and manuals while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
		2.3	Protective covers and panels are fitted to aircraft and stores management system component in accordance with technical publications and manuals
3.	Install SMS component	3.1	Applicable protective covers and panels are removed from aircraft and SMS component in accordance with technical publications and manuals
		3.2	SMS component is fitted to aircraft in accordance with technical publications and manuals while observing all relevant WHS requirements, including the use of MSDS and items of PPE
4.	Complete and process documentation	4.1	Applicable documentation is completed for reconfigured SMS

- 4.2 Documentation is forwarded to Maintenance Control Section (MCS)

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Reconfiguration includes:**
- Removal of currently fitted SMS components
 - Installation of specified SMS components
- Verification includes:**
- Maintenance restrictions
 - Aircraft tail number
 - Aircraft entered as unserviceable
 - Nil stores fitted
- Documentation includes:**
- EE500
 - CAMM2 documents
 - SMS documentation
- Safety devices include:**
- Earth lead
 - Aircraft safety pins
 - Aircraft switches
- Technical publications and manuals include:**
- Aircraft publications
 - Maintenance instruction manuals and process specifications
 - Servicing or service bulletins or structural repair manuals
 - Illustrated parts catalogues, aircraft wiring manuals or drawings
 - Tooling, equipment or manufacturer's manuals
 - Standard practices
 - Enterprise aviation regulations and publications
- SMS components include:**
- Mission computer
 - Armament computer
 - Encoder/decoder
 - Control unit

- Firing devices include:**
- Head-up display (HUD)
 - Multifunction display (MFD)
 - Stores release cartridges
 - Chaff and flares
 - Gun system
 - Missiles
 - Loaded stores
- Checking of firing devices includes:**
- Visually
 - Physically
- Applicable documentation includes:**
- Aircraft documentation
 - SMS component documentation
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA602A Remove and install aircraft stores management system components

(This unit was developed from ADF Enterprise unit DDDRARM301A Remove and install aircraft stores management systems and components and is equivalent to it)

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA602 Remove and install aircraft stores management system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all safety procedures relating to aircraft SMS
- applying hand skills and applicable maintenance documentation in the removal and installation of SMS components
- testing the operation of systems and components
- using ground support equipment and test equipment
- determining SMS reconfiguration requirements
- explosive ordnance safety and handling
- manual handling of SMS components.

The underlying skills inherent in this unit should be transferable across a range of aircraft SMS reconfiguration activities. It is essential that assessment confirms the ability to comply with organisational safety requirements and appropriate legislative and regulatory requirements while maintaining SMS. The ability to work safely within an explosive ordnance environment, conduct applicable tests and maintain relevant documentation is critical, including checking specifically for:

- failure to check aircraft safety devices are installed
- failure to ensure firing devices checked and removed if fitted
- commencing task prior to initiating documentation
- failure to comply with relevant WHS procedures and policies.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the aircraft operating and maintenance environment
- aircraft SMS and interfaces with other aircraft systems
- WHS procedures and policies
- explosive ordnance safety and handling procedures
- technical publications and manuals
- hardware and component attachment methods

- system and component testing requirements
- technical documentation procedures.

Assessment Conditions

- Competency should be assessed on aircraft and/or simulator using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The unit may be assessed independently or in conjunction with unit MEA603 Remove and install aircraft stores suspension system and components.
- Evidence of transferability of skills and knowledge related to SMS component removal and installation is essential. This is to be established through demonstration of the ability to:
 - render the system safe
 - perform relevant inspections and tests
 - replace components
 - perform appropriate maintenance tasks.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the ADF and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a range of system reconfiguration tasks involving the following SMS components:
 - mission computer
 - armament computer
 - encoder/decoder
 - control unit
 - HUD
 - MFD
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- In addition to evidence provided in the Log of Industrial Experience assessment methods may include questioning and observation in operational or simulated environments.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA603 Remove and install aircraft stores suspension system components

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to members of the Australian Defence Force (ADF) who are required to apply explosive ordnance safety and handling procedures, hand skills and use maintenance documentation/publications in the removal and installation of stores suspension system (SSS) components to meet system reconfiguration requirements during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit applies to all aircraft fitted with stores suspension systems.

This unit of competency is part of the Armament Certificate IV training pathway.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF.

Pre-requisite Unit

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
DEFEO101D	Work safely with explosive ordnance

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.	Prepare aircraft for SSS reconfiguration	1.1	SSS reconfiguration task is verified from applicable documentation
		1.2	Aircraft safety devices are checked in accordance with relevant technical publications and manuals
		1.3	Correct SSS component is visually identified for reconfiguration
		1.4	Appropriate tools and ground support equipment are selected in accordance with the task
2.	Remove SSS component	2.1	Firing devices are checked and removed if fitted
		2.2	SSS component is removed from aircraft in accordance with technical publications and manuals while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE)
		2.3	Protective covers and panels are fitted to aircraft and SSS component in accordance with technical publications and manuals
3.	Install SSS component	3.1	Applicable protective covers and panels are removed from aircraft and SSS component in accordance with technical publications and manuals
		3.2	SSS component is fitted to aircraft in accordance with technical publications and manuals while observing all relevant WHS requirements, including the use of MSDS and items of PPE
4.	Complete and process documentation	4.1	Applicable documentation is completed for reconfigured SSS

- 4.2 Documentation is forwarded to Maintenance Control Section (MCS)

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Reconfiguration includes:**
- Removal of currently fitted SSS components
 - Installation of specified SSS components
- Verification includes:**
- Maintenance restrictions
 - Aircraft tail number
 - Aircraft entered as unserviceable
 - Nil stores fitted
- Documentation includes:**
- EE500
 - CAMM2 documents
 - SSS documentation
- Safety devices include:**
- Earth lead
 - Aircraft safety pins
 - Aircraft switches
- Technical publications and manuals include:**
- Aircraft publications
 - Maintenance instruction manuals and process specifications
 - Servicing or service bulletins or structural repair manuals
 - Illustrated parts catalogues, aircraft wiring manuals or drawings
 - Tooling, equipment or manufacturer's manuals
 - Standard practices
 - Enterprise aviation regulations and publications
- SSS components include:**
- Bomb release unit
 - Pylon
 - Missile launcher
- Firing devices include:**
- Stores release cartridges
 - Chaff and flares

- Gun system
 - Missiles
 - Loaded stores
- Checking includes:**
- Visually
 - physically
- Applicable documentation includes:**
- Aircraft documentation
 - SSS component documentation
- Procedures and requirements include:**
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to Remove and install aircraft stores suspension systems and components

(This unit was developed from ADF Enterprise unit DDDRARM302A Remove and install aircraft stores suspension systems and components and is equivalent to it).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA603 Remove and install aircraft stores suspension system components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying safety procedures relating to aircraft SSS
- applying hand skills and applicable maintenance manuals in the removal and installation of SSS components
- using ground support equipment and test equipment
- determining SSS reconfiguration requirements
- explosive ordnance handling and safety
- manual handling of SSS components.

The underlying skills inherent in this unit should be transferable across a range of aircraft SSS reconfiguration activities. It is essential that assessment confirms the ability to comply with organisational safety requirements and appropriate legislative and regulatory requirements while maintaining SSS systems. The ability to work safely within an explosive ordnance environment, conduct applicable tests and maintain relevant documentation is critical, including checking specifically for:

- failure to check aircraft safety devices are installed
- failure to ensure firing devices checked and removed if fitted
- commencing task prior to initiating documentation
- failure to comply with relevant WHS procedures and policies.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the aircraft operating and maintenance environment
- aircraft SSS and interfaces with the stores management system and other aircraft systems
- WHS procedures and policies
- explosive ordnance safety and handling procedures
- technical publications and manuals
- hardware and component attachment methods
- system and component test procedures

- technical documentation procedures.

Assessment Conditions

- Competency should be assessed on aircraft and/or simulator using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The unit may be assessed independently or in conjunction with unit MEA602 Remove and install aircraft stores management system components.
- Evidence of transferability of skills and knowledge related to SSS system component removal and installation is essential. This is to be established through demonstration of the ability to:
 - render the system safe
 - perform relevant inspections and tests
 - replace components
 - perform appropriate maintenance tasks.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the ADF and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a range of system reconfiguration tasks involving the following SSS components:
 - bomb release unit
 - pylon
 - missile launcher.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- In addition to evidence provided in the Log of Industrial Experience assessment methods may include questioning and observation in operational or simulated environments.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA604 Inspect, test and troubleshoot aircraft stores management systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to members of the Australian Defence Force (ADF) who are required to apply explosive ordnance safety and handling procedures, hand skills and the use of maintenance documentation/publications in the inspection, testing and troubleshooting of stores management systems (SMS) and components.

The unit applies to all aircraft with stores management systems.

The unit is part of the Armament Certificate IV training pathway.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF.

Pre-requisite Unit

MEA602 Remove and install aircraft stores management system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. Prepare to inspect, | 1.1 The task is verified from applicable documentation |
|----------------------------|--|

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|---|-----|---|
| test and troubleshoot aircraft SMS and components | 1.2 | Aircraft safety devices are checked in accordance with relevant technical publications and manuals |
| | 1.3 | Correct SMS component is visually identified for inspection, testing and troubleshooting |
| | 1.4 | Appropriate tools and ground support equipment are selected in accordance with the task |
| 2. Inspect SMS component | 2.1 | Firing devices are checked and removed if fitted |
| | 2.2 | SMS component is inspected in accordance with technical publications and manuals while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 2.3 | Aircraft is prepared for testing and troubleshooting of SMS component in accordance with technical publications and manuals |
| 3. Test and troubleshoot SMS component | 3.1 | SMS component is functionally tested in accordance with applicable technical publications and manuals for evidence of serviceability or malfunction |
| | 3.2 | SMS component faults are identified in accordance with technical publications and manuals |
| | 3.3 | Specialist advice is obtained when required to assist with the troubleshooting process |
| | 3.4 | Corrective action is taken in accordance with technical publications and manuals while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| 4. Complete and process documentation | 4.1 | Applicable documentation is completed for SMS component inspection, testing and troubleshooting |
| | 4.2 | Completed documentation is forwarded to Maintenance Control Section (MCS) |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Task verification includes:**
- Maintenance restrictions
 - Aircraft tail number
 - Aircraft entered as unserviceable
 - Nil stores fitted
- Documentation includes:**
- EE500
 - CAMM2 documents
 - SMS documentation
- Safety devices include:**
- Earth lead
 - Aircraft safety pins
 - Aircraft switches
- Technical publications and manuals include:**
- Aircraft publications
 - Maintenance instruction manuals and process specifications
 - Servicing or service bulletins or structural repair manuals
 - Illustrated parts catalogues, aircraft wiring manuals or drawings
 - Tooling, equipment or manufacturer's manuals
 - Standard practices
 - Enterprise aviation regulations and publications
- SMS components include:**
- Mission computer
 - Armament computer
 - Encoder/decoder
 - Control unit
 - Head-up display (HUD)
 - Multifunction display (MFD)
- Firing devices include:**
- Stores release cartridges
 - Chaff and flares
 - Gun system
 - Missiles
 - Loaded stores

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- | | |
|---|---|
| Checking includes: | <ul style="list-style-type: none">• Visually• Physically |
| Aircraft preparation includes: | <ul style="list-style-type: none">• Panels opened• Ground support equipment and test equipment connected |
| Specialist advice is obtained from: | <ul style="list-style-type: none">• Subject matter experts• Manufacturers• Systems program office |
| Corrective action includes: | <ul style="list-style-type: none">• Repair• Component replacement |
| Applicable documentation includes: | <ul style="list-style-type: none">• Aircraft documentation• SMS component documentation |
| Procedures and requirements include: | <ul style="list-style-type: none">• Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise |

Unit Mapping Information

Release 1 – equivalent to MEA604A Inspect, test and troubleshoot aircraft stores management systems and components

(The unit was developed from ADF Enterprise unit DDRARM401A Inspect, test and troubleshoot aircraft stores management systems and components and is equivalent to it).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA604 Inspect, test and troubleshoot aircraft stores management systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all safety procedures relating to aircraft SMS
- applying hand skills and use of applicable maintenance manuals in removal and installation of SMS components
- using ground support equipment and test equipment
- applying logic processes, taking and interpreting measurements, using test equipment and appropriate documentation and manuals to isolate SMS malfunctions
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- explosive ordnance handling
- manual handling of SMS components.

The underlying skills inherent in this unit should be transferable across a range of aircraft SMS and system component inspection, testing and troubleshooting activities. It is essential that assessment confirms the ability to comply with organisational safety requirements and appropriate legislative and regulatory requirements while maintaining SMS systems. The ability to work safely within an explosive ordnance environment, conduct applicable tests and maintain relevant documentation is critical, including checking specifically for:

- failure to check aircraft safety devices are installed
- failure to ensure firing devices checked and removed if fitted
- commencing task prior to initiating documentation
- failure to comply with relevant WHS procedures and policies.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the aircraft operating and maintenance environment
- aircraft SMS and interfaces with other aircraft systems
- WHS procedures and policies
- SMS and component test procedures
- explosive ordnance safety and handling procedures

- technical publications and manuals
- hardware and component attachment methods
- technical documentation procedures.

Assessment Conditions

- Competency should be assessed on aircraft and/or simulator using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The unit may be assessed independently or in conjunction with unit MEA605 Inspect, test and troubleshoot aircraft stores suspension systems and components.
- Evidence of transferability of skills and knowledge related to SMS and system component inspection, testing and troubleshooting is essential. This is to be established through demonstration of the ability to:
 - render the system safe
 - perform relevant inspections and tests
 - troubleshoot faults and perform appropriate rectification action.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the ADF and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a range of inspection, testing and troubleshooting tasks involving the following SMS components:
 - mission computer
 - armament computer
 - encoder/decoder
 - control unit
 - HUD
 - MFD.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- In addition to evidence provided in the Log of Industrial Experience assessment methods may include questioning and observation in operational or simulated environments.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
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MEA605 Inspect, test and troubleshoot aircraft stores suspension systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to members of the Australian Defence Force (ADF) who are required to apply explosive ordnance safety and handling procedures, hand skills and the use of maintenance documentation/publications in the inspection, testing and troubleshooting of stores suspension systems (SSS) and components during the performance of scheduled or unscheduled maintenance. Maintenance may be performed individually or as part of a team.

The unit applies to all aircraft fitted with stores suspension systems.

This unit of competency is part of the Armament Certificate IV training pathway.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF.

Pre-requisite Unit

MEA603 Remove and install aircraft stores suspension system components

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. Prepare to inspect, | 1.1 The task is verified from applicable documentation |
|------------------------|--|

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|---|-----|---|
| test and troubleshoot aircraft SSS and components | 1.2 | Aircraft safety devices are checked in accordance with relevant technical publications and manuals |
| | 1.3 | Correct SSS component is visually identified for inspection, testing and troubleshooting |
| | 1.4 | Appropriate tools and ground support equipment are selected in accordance with the task |
| | 2.1 | Firing devices are checked and removed if fitted |
| 2. Inspect SSS component | 2.2 | SSS component is inspected in accordance with technical publications and manuals while observing all relevant work health and safety (WHS) requirements, including the use of material safety data sheets (MSDS) and items of personal protective equipment (PPE) |
| | 2.3 | Aircraft is prepared for testing and troubleshooting of SSS component in accordance with technical publications and manuals |
| | 3.1 | SSS component is functionally tested in accordance with applicable technical publications and manuals for evidence of serviceability or malfunction |
| 3. Test and troubleshoot SSS component | 3.2 | SSS component faults are identified in accordance with technical publications and manuals |
| | 3.3 | Specialist advice is obtained when required to assist with the troubleshooting process |
| | 3.4 | Corrective action is taken in accordance with technical publications and manuals while observing all relevant WHS requirements, including the use of MSDS and items of PPE |
| | 4.1 | Applicable documentation is completed for SSS component inspection, testing and troubleshooting |
| 4. Complete and process documentation | 4.2 | Completed documentation is forwarded to Maintenance Control Section (MCS) |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Task verification includes:**
- Maintenance restrictions
 - Aircraft tail number
 - Aircraft entered as unserviceable
 - Nil stores fitted
- Documentation includes:**
- EE500
 - CAMM2 documents
 - SMS documentation
- Safety devices include:**
- Earth lead
 - Aircraft safety pins
 - Aircraft switches
- Technical publications and manuals include:**
- Aircraft publications
 - Maintenance instruction manuals and process specifications
 - Servicing or service bulletins or structural repair manuals
 - Illustrated parts catalogues, aircraft wiring manuals or drawings
 - Tooling, equipment or manufacturer's manuals
 - Standard practices
 - Enterprise aviation regulations and publications
- SSS components include:**
- Bomb release unit
 - Pylon
 - Missile launcher
- Firing devices include:**
- Stores release cartridges
 - Chaff and flares
 - Gun system
 - Missiles
 - Loaded stores
- Checking includes:**
- Visually
 - Physically
- Aircraft preparation**
- Panels opened
 - Ground support equipment and test equipment connected

includes:

Specialist advice is obtained from:

- Subject matter experts
- Manufacturer
- Systems program office

Corrective action includes:

- Repair
- Component replacement

Applicable documentation includes:

- Aircraft documentation
- Stores suspension system component documentation

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA605A Inspect, test and troubleshoot aircraft stores suspension systems and components

(The unit was developed from ADF Enterprise unit DDRARM402A Inspect, test and troubleshoot aircraft stores suspension systems and components and is equivalent to it).

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA605 Inspect, test and troubleshoot aircraft stores suspension systems and components

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying all safety procedures relating to aircraft SSS
- applying hand skills in removal and installation of SSS components
- using ground support equipment and test equipment
- applying system and component knowledge and logical fault-finding procedures and applicable maintenance data in the troubleshooting of SSS and component faults
- performing system functional tests and checks to isolate system faults and assess post-maintenance serviceability
- explosive ordnance safety and handling procedures
- manual handling of SMS components.

The underlying skills inherent in this unit should be transferable across a range of aircraft SSS and system component inspection, testing and troubleshooting activities. It is essential that assessment confirms the ability to comply with organisational safety requirements and appropriate legislative and regulatory requirements while maintaining SSS. The ability to work safely within an explosive ordnance environment, conduct applicable tests and maintain relevant documentation is critical, including checking specifically for:

- failure to check aircraft safety devices are installed
- failure to ensure firing devices checked and removed if fitted
- commencing task prior to initiating documentation
- failure to comply with relevant WHS procedures and policies.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the aircraft operating and maintenance environment
- aircraft SSS and component operation and interfaces with other aircraft systems
- hardware and component attachment methods
- WHS procedures and policies
- explosive ordnance safety and handling procedures

- technical publications and manuals
- technical documentation procedures.

Assessment Conditions

- Competency should be assessed on aircraft and/or simulator using materials, tools and equipment specified in the maintenance manuals and applicable procedures. It is also expected that general and special-purpose tools and ground support equipment would be used where appropriate.
- The unit may be assessed independently or in conjunction with unit MEA604 Inspect, test and troubleshoot aircraft stores management systems and components.
- Evidence of transferability of skills and knowledge related to SSS and component inspection, testing and troubleshooting is essential. This is to be established through demonstration of the ability to:
 - render the system safe
 - perform relevant inspections and tests
 - troubleshoot faults and perform appropriate rectification action.
- The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.
- The following conditions of assessment represent the requirements of the ADF and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on a range of inspection, testing and troubleshooting tasks involving the following SSS components:
 - bomb release unit
 - pylon
 - missile launcher.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- In addition to evidence provided in the Log of Industrial Experience assessment methods may include questioning and observation in operational or simulated environments.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A701 Produce aeronautical engineering related graphics

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to aircraft structure and to aircraft systems products, projects, and related system modifications. It is suitable for people working in aeronautical related design, drafting and maintenance support at the paraprofessional level.

The unit covers the application of graphical techniques for aeronautical engineering related purposes. Graphics techniques include sketching, computer graphics and the application of drawing standards.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A137	Write aviation technical publications
MEM30007A	Select common engineering materials
MEM30012A	Apply mathematical techniques in manufacturing, engineering or related situations

Competency Field

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Review the fundamentals of engineering graphics	1.1 Review uses for aeronautical graphics 1.2 Review engineering drawing standards

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|--------------------------------|-----|---|
| for aeronautical applications | 1.3 | Review graphical imaging or modelling techniques and conventions |
| | 1.4 | Review conventional representations of structure and of mechanical, hydraulic and pneumatic features and components, including related electrical and electronic control circuits |
| | 1.5 | Review computer-aided design (CAD) and other related software for currency and relevance |
| | 1.6 | Check and determine relevance of work health and safety (WHS) and regulatory requirements, codes of practice, risk assessment and registration requirements for graphical representation tasks |
| | 1.7 | Confirm the availability and features of a range of standards related to aircraft structure and aeronautical system and component design, maintenance and modification |
| | 1.8 | Review typical criteria for aeronautical designs |
| 2. Apply aeronautical graphics | 2.1 | Determine engineering graphics required by aeronautical applications |
| | 2.2 | Apply relevant standards |
| | 2.3 | Represent aircraft structure and aeronautical components and systems with sketching and computer graphical techniques, including orthogonal, three-dimensional imaging, wiring diagrams, circuit diagrams and system schematic drawings |
| | 2.4 | Determine and apply required dimensioning, tolerancing for limits and fits, surface finish, weld symbols, electrical, electronic and other required graphical convention information appropriate to aeronautical engineering applications |
| | 2.5 | Seek technical and professional assistance or clarification of design information as required |
| | 2.6 | Confirm final graphical representations with professional engineering staff and other stakeholders, including making any required adjustments |

- | | | |
|----|---|---|
| | 2.7 | Engage appropriate licensed technical and professional assistance for advice as required |
| 3. | Provide final drawings, files and documents | 3.1 Provide documentation, graphics, data files and clearances according to job requirements and regulatory and enterprise drawing management system and procedures |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Criteria for aeronautical designs include:

- Function
- Design authority regulatory requirements
- Aircraft design specifications
- Application of configuration management (CM) and/or integrated logistic support (ILS) requirements

Configuration management (CM)

- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life

Integrated logistic support (ILS)

- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation

Features, functions and context of engineering graphics include:

- design interface
- Uses of graphics for purposes, such as:
 - design specifications
 - production specifications
 - maintenance procedures
 - technical specifications and descriptions
- Graphical representation techniques, including orthogonal, 2-D and 3-D modelling, isometric and mechanical perspective, dimensioning, limits and fits, welding and other standard symbols
- Role of WHS and regulatory requirements, codes of practice, risk assessment and registration requirements
- Availability and features of a range of standards related to aircraft structure and system design, maintenance and modification
- Typical criteria for aeronautical designs
- Software developments
- Current graphical methods compared with traditional methods
- Emerging developments in graphics and related engineering software

Aeronautical systems and components include:

- Structure and structural components
- Mechanical systems and components
- Hydraulic systems and components
- Pneumatic systems and components
- Fuel systems and components
- Power plants (engines and engine systems and components)
- Standard fasteners and locking systems
- Electrical
- Electronic
- Automatic flight and automatic engine control interface

Appropriate technical and professional assistance includes:

- Assistance from individuals with Civil Aviation Safety Authority (CASA) maintenance certification licenses or those with supervisory authorisations in the Australian Defence Force (ADF) regulatory system
- Professional support from engineers employed within:
 - organisations with CASA design, continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
- Engineers employed within organisations recognised by overseas airworthiness organisations

WHS, regulatory requirements and enterprise procedures include:

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- State and territory regulatory requirements applying to electrical work

Aviation regulatory requirements include:

- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities where applicable e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Relevant standards include:

- AS 1100.101-1992 Technical drawing – General principles
- AS 1102.101-1989 Graphical symbols for electrotechnical documentation - General information and general index
- AS/NZS ISO 31000 Set:2013 Risk Management Set
- DEF(AUST) 5085B Engineering Drawing – Acquisition and Preparation for Defence Equipments Part 1 – Acquisition Requirements
- DEF(AUST) 5085B Engineering Drawing – Acquisition and Preparation for Defence Equipments Part 2 – Preparation Requirements
- FAA 8083-30 Chapter 2 Aircraft Drawings
- British Defence Standard 00-970 Design and Airworthiness Requirements for Service Aircraft
- US Military Specifications and Standards relevant to aircraft design
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- CASA AC 21-99 Aircraft Wiring and Bonding
- FAA AC 43-13-1B Acceptable Methods, Techniques and

Practices – Aircraft Inspection and Repair

Unit Mapping Information

Release 1 – new unit based on and equivalent to MEM09143A Represent aeronautical engineering designs

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA701 Produce aeronautical engineering related graphics

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- reviewing aeronautical engineering applications for required features, functions and context of aeronautical engineering graphics
- developing orthographic, isometric and other 3-D graphical representations and techniques for structure, mechanical, hydraulic, pneumatic, power plant, electrical and electronic system representation
- representing aeronautical components and systems using sketching and computer graphics with regard to the following:
 - structure and structural components
 - mechanical systems and components
 - hydraulic systems and components
 - pneumatic systems and components
 - fuel systems and components
 - power plants
 - standard fasteners and locking systems
 - electrical
 - electronic
- representing aeronautical components and features using a comprehensive range of standard conventions and graphical techniques
- representing a range of aeronautical systems using standard graphical representations for wiring, circuit and schematic diagrams
- engaging appropriate technical and professional assistance for advice as required
- reporting results of review and the application of graphics techniques and providing documentation, images and files according to job, regulatory and enterprise procedures.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- uses for graphics, such as:

- design specifications
- aircraft maintenance procedures
- modification orders and instructions
- technical specifications and descriptions
- physical arrangement of mechanical, hydraulic, pneumatic, power plant, and associated electrical and electronic systems and components
- diagrammatic layouts of electrical and electronic circuits
- aeronautical system schematic diagrams
- graphical representation techniques
- role of WHS and regulatory requirements, codes of practice, risk assessment and registration requirements relevant to aeronautical applications
- availability and features of standards related to aeronautical structure, power plants, systems and component, design, maintenance and modification
- typical criteria for aeronautical designs
- sketching techniques
- orthographic and 3-D representations
- hole basis, shaft basis and keyway tolerances and fits
- dimensioning conventions
- representing aeronautical components and systems using sketching and computer graphics
- standard conventions and graphical techniques as specified in standards, such as those listed in the Range of Conditions:
 - hole basis, shaft basis and keyway tolerances and fits
 - dimensioning, tolerancing for limits and fits
 - surface finish
 - weld symbols
 - webs, cross sections and cutting planes
 - chain drives, gear sets, pulley and belt drives
 - threads, fasteners and springs
 - shafts, keyways and splines
 - structural sections
 - surface finishes and welds
 - webs, cross sections, cutting planes
 - electric motors and electrically operated fluid power actuators
 - electrical, electronic, electro fluid (hydraulic and pneumatic) controls
- representations of aeronautical structure, systems and components, including:
 - structure and structural components
 - mechanical systems and components
 - hydraulic systems and components
 - pneumatic systems and components
 - fuel systems and components
 - power plants (engines and engine systems and components)

- standard fasteners and locking systems
- electrical
- electronic
- automatic flight and automatic engine control interface
- current and traditional methods of documentation generation and control:
 - computer library files compared to the use of reference charts and catalogue information
 - generation of orthogonal images from models
 - manual drawing
 - future developments in graphics and related engineering software
- worksite procedures and regulatory requirements for the processing and filing of graphics, specifications and operating and maintenance instructions/manuals, including CM and ILS requirements.
-

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - review features, functions and context of aeronautical engineering graphics
 - develop orthographic, isometric and other 3-D graphical representations and techniques for mechanical, fluid, electrical and electronic system representation
 - represent aeronautical components and assemblies using sketching and computer graphics
 - represent aeronautical components and features using a comprehensive range of standard conventions and graphical techniques
 - represent a range of aeronautical systems using standard graphical representations for wiring diagrams and system schematic diagrams
 - engage appropriate technical and professional assistance for advice as required
 - report results of review and the application of graphics techniques and provide documentation, images and files

- maintain accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A702 Produce avionics engineering related graphics

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to avionic products, projects and related system modifications. It is suitable for people working in avionics related design, drafting and maintenance support at the paraprofessional level.

The unit covers the application of graphical techniques for avionic engineering related purposes. Graphics techniques include sketching, computer graphics and the application of drawing standards.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A137	Write aviation technical publications
MEM30007A	Select common engineering materials
MEM30012A	Apply mathematical techniques in manufacturing, engineering or related situations

Competency Field

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Review the fundamentals of engineering graphics	1.1 Review uses for avionic graphics
	1.2 Review engineering drawing standards

- | | | |
|----------------------------|-----|---|
| for avionic applications | 1.3 | Review graphical imaging or modelling techniques and conventions |
| | 1.4 | Review conventional representations of mechanical features and components, electrical, electronic and fluid control circuits |
| | 1.5 | Review computer-aided design (CAD) and other related software for currency and relevance |
| | 1.6 | Check and determine relevance of work health and safety (WHS) and regulatory requirements, codes of practice, risk assessment and registration requirements for graphical representation tasks |
| | 1.7 | Confirm the availability and features of a range of standards related to avionic system and component design, maintenance and modification |
| | 1.8 | Review typical criteria for avionic designs |
| 2. Apply avionics graphics | 2.1 | Determine engineering graphics required by avionics applications |
| | 2.2 | Apply relevant standards |
| | 2.3 | Represent avionics components and systems with sketching and computer graphical techniques, including orthogonal, three-dimensional imaging, wiring diagrams, circuit diagrams and system schematic drawings |
| | 2.4 | Determine and apply required dimensioning, tolerancing for limits and fits, surface finish, weld symbols, electrical, electronic and other required graphical convention information appropriate to avionics engineering applications |
| | 2.5 | Seek technical and professional assistance or clarification of design information as required |
| | 2.6 | Confirm final graphical representations with professional engineering staff and other stakeholders, including making any required adjustments |
| | 2.7 | Engage appropriate licensed technical and professional assistance for advice as required |
| 3. Provide final | 3.1 | Provide documentation, graphics, data files and |

drawings, files and documents

clearances according to job requirements and enterprise drawing management system and procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Criteria for avionic designs include:

- Function
- Design authority regulatory requirements
- Avionic design specifications
- Application of configuration management (CM) and/or integrated logistic support (ILS) requirements

Configuration Management (CM)

- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life

Integrated Logistic Support (ILS)

- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface

Features, functions and

- Uses of graphics for purposes, such as:

context of engineering graphics include:

- design specifications
- production specifications
- maintenance procedures
- technical specifications and descriptions
- Graphical representation techniques, including orthogonal, 2-D and 3-D modelling, isometric and mechanical perspective, dimensioning, limits and fits, welding and other standard symbols
- Role of WHS and regulatory requirements, codes of practice, risk assessment and registration requirements
- Availability and features of a range of standards related to avionic system design, maintenance and modification
- Typical criteria for avionic designs
- Software developments
- Current graphical methods compared with traditional methods
- Emerging developments in graphics and related engineering software

Avionic systems and components include:

- Electrical power generation and distribution
- Electrical actuation and/or control associated with mechanical, hydraulic, pneumatic and flight control systems
- Instruments, including compasses and inertial navigation
- Radio communications and navigation
- Pulse including radars and navigation systems
- Automatic flight control systems
- Automatic engine control systems
- Data communications, including in-flight entertainment
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
- Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
- Engineers employed within organisations recognised by overseas airworthiness organisations

Appropriate licensed technical and professional assistance include:**WHS, regulatory requirements and enterprise procedures include:**

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements

- Safe work practices
 - State and territory regulatory requirements applying to electrical work
 - Civil Aviation Safety Regulations (CASRs)
 - AAP7001.053 ADF Technical Airworthiness Management Manual
 - Overseas airworthiness authorities where applicable e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency
- Relevant standards include:**
- AS 1100.101-1992 Technical drawing – General principles
 - AS 1102.101-1989 Graphical symbols for electrotechnical documentation - General information and general index
 - AS/NZS ISO 31000 Set:2013 Risk Management Set
 - AS/NZS 3947.3:2001 Low-voltage switchgear and control gear - Switches, disconnectors, switch-disconnectors and fuse-combination units
 - AS 1403-2004 Design of rotating steel shafts
 - DEF AUST Specifications applicable to avionics
 - British Defence Standard 00-970 Design and Airworthiness Requirements for Service Aircraft
 - US Military Specifications relevant to avionics
 - US FAA design standards for avionics

Unit Mapping Information

Release 1 – new unit based on and equivalent to MEM09144A Represent avionics engineering designs

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA702 Produce avionics engineering related graphics

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- reviewing avionic engineering applications for required features, functions and context of avionic engineering graphics
- developing orthographic, isometric and other 3-D graphical representations and techniques for mechanical, fluid, electrical and electronic system representation
- representing avionic components and systems using sketching and computer graphics with regard to the following systems:
 - electrical
 - instrument
 - radio
 - automatic flight and automatic engine control
 - data communications
- representing avionic components and features using a comprehensive range of standard conventions and graphical techniques
- representing a range of avionic systems using standard graphical representations for wiring, circuit and schematic diagrams
- engaging appropriate technical and professional assistance for advice as required
- reporting results of review and the application of graphics techniques and providing documentation, images and files according to job, regulatory and enterprise procedures.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- uses for graphics, such as:
 - design specifications
 - avionic maintenance procedures
 - modification orders and instructions
 - technical specifications and descriptions

- physical arrangement of mechanical, fluid, electrical and electronic systems and components
- diagrammatic layouts of electrical and electronic circuits
- avionic system schematic diagrams
- graphical representation techniques
- role of WHS and regulatory requirements, codes of practice, risk assessment and registration requirements relevant to avionic applications
- availability and features of standards related to avionic systems and component, design, maintenance and modification
- typical criteria for avionic designs
- sketching techniques
- orthographic and 3-D representations
- hole basis, shaft basis and keyway tolerances and fits
- dimensioning conventions
- representing avionic components and systems using sketching and computer graphics
- standard conventions and graphical techniques as specified in standards, such as those listed in the Range of Conditions:
 - hole basis, shaft basis and keyway tolerances and fits
 - dimensioning, tolerancing for limits and fits
 - surface finish
 - weld symbols
 - webs, cross sections and cutting planes
 - chain drives, gear sets, pulley and belt drives
 - threads, fasteners and springs
 - shafts, keyways and splines
 - structural sections
 - surface finishes and welds
 - webs, cross sections, cutting planes
 - electric motors and electrically operated fluid power actuators
 - electrical, electronic, electro fluid (hydraulic and pneumatic) controls
 - electrical and electronic circuit components
- representations of avionic systems and components, including:
 - construction of artwork for printed circuit boards
 - aircraft electrical power generation and distribution
 - control and indication for mechanical, fluid power and flight control systems
 - aircraft instrument systems
 - radio communication and navigation
 - pulse
 - automatic flight and automatic engine control
 - data communications, including in-flight entertainment
- current and traditional methods of documentation generation and control:

- computer library files compared to the use of reference charts and catalogue information
- generation of orthogonal images from models
- manual drawing
- future developments in graphics and related engineering software
- worksite procedures and regulatory requirements for the processing and filing of graphics, specifications and operating and maintenance instructions/manuals, including CM and ILS requirements.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - review features, functions and context of avionic engineering graphics
 - develop orthographic, isometric and other 3-D graphical representations and techniques for mechanical, fluid, electrical and electronic system representation
 - represent avionic components and assemblies using sketching and computer graphics
 - represent avionic components and features using a comprehensive range of standard conventions and graphical techniques
 - represent a range of avionic systems using standard graphical representations for wiring diagrams and system schematic diagrams
 - engage appropriate licensed technical and professional assistance for advice as required
 - report results of review and the application of graphics techniques and provide documentation, images and files.
- Assessment may be in conjunction with assessment of other units of competency where required.

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A703 Apply aeronautical modelling for computer-aided engineering

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to modelling of aeronautical systems and components for civil or military aircraft. It is suitable for people working as design drafters and those pursuing paraprofessional careers and qualifications in aeronautical engineering at the paraprofessional level.

This unit of competency covers the application of aeronautical modelling techniques for aircraft, aircraft structure, systems and component design, modification or maintenance purposes. It includes consideration of the computer-aided engineering (CAE) purposes for which the model is required, such as initial design, modification design or maintenance and as a basis for generating orthogonal drawings and wiring, circuit and schematic diagrams.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A701 Produce aeronautical engineering related graphics

Competency Field

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes. Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Identify the fundamentals of aeronautical | 1.1 Investigate applications for aeronautical modelling |
| | 1.2 Identify sustainability issues related to modelling |

- | | | |
|-------------------------------|-----|--|
| engineering modelling | 1.3 | Identify work health and safety (WHS) and regulatory requirements related to modelling processes and materials |
| | 1.4 | Identify the model parameters, form, function and features, virtual or physical |
| | 1.5 | Identify processes required which may include those for generating graphics, post-processing and physical modelling |
| | 1.6 | Identify technical and professional assistance for advice as required |
| 2. Develop aeronautical model | 2.1 | Generate initial graphical model and adjust in consultation with stakeholders in accordance with procedures or agreement |
| | 2.2 | Prepare model for intended purpose |
| | 2.3 | Use model for purpose and complete investigative analysis or produce physical model |
| | 2.4 | Evaluate model against design criteria and with stakeholders and make adjustments as required |
| | 2.5 | Engage appropriate technical and professional assistance for advice as required |
| 3. Finalise model | 3.1 | Report and demonstrate results |
| | 3.2 | Provide documentation, instructions, models and files as required |
| | 3.3 | Obtain sign-off |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Models include:

- Virtual, such as computer generated solids models
- Physical models developed from the virtual model data
- Software models

Model purpose includes:

- Aircraft design, including performance and power required
- Component design (structural, mechanical, hydraulic and pneumatic)
- System design and performance simulation (mechanical, hydraulic and pneumatic)

Features, functions and context of engineering mechanical modelling include:

- Techniques used for mechanical modelling
- Sustainability implications of modelling
- WHS and regulatory requirements related to modelling processes and materials
- Model parameters, form, function and features, virtual or physical
- Processes required which may include those for generating graphics, post-processing, and physical modelling
- Required licensed technical and professional assistance

Post-processor

- A post-processor or code generator converts programmed instructions generated by computer-aided manufacture (CAM) software or computer-aided design (CAD) package into computer numerically controlled (CNC) program code to control a machine tool

Post-processing model for analysis or physical modelling includes:

- Setting up component, system and system software models
- Processing dimensional data to create 2-D or 3-D code for CAM operations, such as printed circuit board manufacture

Rapid prototyping processes include:

- Selective laser sintering (SLS) which uses thermoplastics and metal powders
- Fused deposition modelling (FDM) which uses thermoplastics and eutectic metals
- Stereolithography (SL) which uses a photopolymer
- Laminated paper manufacturing (LOM) which uses paper
- Electron beam melting (EBM) which uses titanium alloys
- 3-D printing (3DP) which uses a variety of materials

Criteria for aeronautical designs include:

- Safety and risk
- Function

Appropriate technical and professional assistance includes:

- Aesthetics
- Compliance with relevant regulations and standards
- Manufacturability and maintainability
- Marketability
- Sustainability:
 - social, economic and environmental
 - material and energy resources
- Cost constraints
- Ergonomics, anthropometrics and physiology
- Facilities, plant and skills available
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
- Professional support from engineers employed within:
 - organisations with CASA design, continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
- Engineers employed within organisations recognised by overseas airworthiness organisations

WHS, regulatory requirements and enterprise procedures include:

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- State and territory regulatory requirements applying to electrical work
- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities where applicable e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Relevant standards include:

- AS 1100.101-1992 Technical drawing – General principles
- AS 1102.101-1989 Graphical symbols for electrotechnical documentation - General information and general index
- AS/NZS ISO 31000 Set:2013 Risk Management Set
- British Defence Standard 00-970 Design and Airworthiness Requirements for Service Aircraft

- US Military Specifications and Standards relevant to aircraft design
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- CASA AC 21-99 Aircraft Wiring and Bonding
- FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair
- Lumped parameter model
- Empirical, random data tested model
- Finite element analysis (FEA) software
- Model based design

Modelling and related software includes:

Unit Mapping Information

Release 1 – new unit based on and equivalent to MEM09153A Apply computer-aided modelling and data management techniques to aeronautical engineering designs

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA703 Apply aeronautical modelling for computer-aided engineering

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- investigating the uses of aeronautical models for aircraft, structure, aircraft systems and components
- reviewing features, functions and context of aeronautical modelling
- comparing available software, functions and features
- communicating, participating and negotiating with:
 - stakeholders, team, cross-function support groups and experts
 - appropriate licensed technicians and professionals
- performing modelling using a comprehensive range of techniques, such as:
 - creating and manipulating 3-D entities
 - using library files and adaptations
 - top down system simulation
- comparing available software, functions and features
- creating dimensioned orthographic projections from model
- extracting dimensional properties from model
- using post-processing model for analysis or physical modelling
- modelling aeronautical component and system hardware and software
- finalising modelling by:
 - completing work
 - gaining approval and commissioning work
 - providing documentation and reports as required
 - obtaining sign-off.
-

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- engineering and market context for aeronautical component and systems modelling:
 - relative speed compared to traditional methods related to quantities

- market demand speed, standardisation, quality and flexibility through data
- sustainability implications of modelling: economic, social and environmental
- aeronautical models, such as:
 - aircraft design, including performance and power requirements
 - aircraft structure and components
 - mechanical systems and components
 - hydraulic systems and components
 - pneumatic systems and components
 - flight control systems and components
 - electrical and electronic control interfaces
- software functions and features:
 - modelling software
 - model analysis software (e.g. FEA)
 - post-processor, CNC/CAM and rapid prototyping
 - regulations relating to the design of aeronautical software
- model creation techniques, such as:
 - using and manipulating coordinate systems
 - creating 3-D entities, ruled and revolved surfaces
 - creating solids, editing and combining solids
 - manipulating entities and solids
 - library files
 - manipulations of solids and library files
 - 3-D graphics from models, including rotated views and sections
 - dimensioned orthographic representations from models
 - top down system simulation
 - construction of artwork for printed circuit boards
- typical modelling processes, including:
 - computer modelling
 - post-processing
 - prototyping and model manufacture
- virtual model options, such as automated systems simulation
- physical modelling options, such as:
 - post-processing to create NC data files to CNC circuit board assembly
 - rapid prototyping options
- WHS requirements:
 - WHS Acts and regulations, which recognise that stakeholders in workplace activities include the workforce exposed to worksite conditions, materials and processes of the activity and also recognise the broader community exposed to environmental effects of the activity. Competence in designing for and implementation of the Act, regulations, codes, directives, risk management and standards is required by other units

- relevant standards that give guidance to complying with the WHS Act
- codes of practice, risk assessment and registration requirements
- requirement for licensed technical and professional services
- modelling compared to traditional methods, such as:
 - pen and pencil graphics compared to wire frame, surface and solid models
 - computer animations compared to transparent overlay mobiles to test clearances and motions
 - solid models compared to isometric representations
 - computer library files compared to the use of reference charts and catalogue information
- future developments in modelling and related engineering software:
 - new developments in computer aided engineering
 - dynamic response of models
 - new developments in rapid prototyping and manufacturing
- animations and simulations.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate competently and consistently:
 - review features, functions and context of aeronautical modelling
 - compare available software, functions and features
 - communicate, participate and negotiate with stakeholders, team, cross-function support groups and experts, appropriate licensed technicians and professionals
 - model using a comprehensive range of techniques
 - create dimensioned orthographic projections from model
 - extract dimensional properties from model
 - post-process model for analysis or physical modelling
 - complete work, commission and gain approval, document and report, obtain sign-off

- identify future developments in modelling.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A704 Apply avionic modelling for computer-aided engineering

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to modelling of avionic systems and components for civil or military aircraft. It is suitable for people working as design drafters and those pursuing paraprofessional careers and qualifications in avionics.

The unit covers the application of avionic modelling techniques for avionic component or systems design or maintenance purposes. It includes consideration of the computer-aided engineering (CAE) purposes for which the model is required, such as electrical or electronic component or system, printed circuit board manufacture and assembly and as a basis for generating orthogonal drawings and wiring, circuit and schematic diagrams.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A702 Produce avionic engineering related graphics

Competency Field

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Identify the fundamentals of avionic engineering modelling | 1.1 Investigate applications for avionic modelling |
| | 1.2 Identify sustainability issues related to modelling |
| | 1.3 Identify work health and safety (WHS) and regulatory requirements related to modelling processes and |

- materials
- 1.4 Identify the model parameters, form, function and features, virtual or physical
 - 1.5 Identify processes required which may include those for generating graphics, post-processing, and physical modelling
 - 1.6 Identify licensed technical and professional assistance for advice as required
2. Develop avionic model
- 2.1 Generate initial graphical model and adjust in consultation with stakeholders in accordance with procedures or agreement
 - 2.2 Prepare model for intended purpose
 - 2.3 Use model for purpose and complete investigative analysis or produce physical model
 - 2.4 Evaluate model against design criteria and with stakeholders and make adjustments as required
 - 2.5 Engage appropriate technical and professional assistance for advice as required
3. Finalise model
- 3.1 Report and demonstrate results
 - 3.2 Provide documentation, instructions, models and files as required
 - 3.3 Obtain sign-off

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Models include:**
- Virtual, such as computer generated solids models
 - Physical models developed from the virtual model data
 - Software models
- Model purpose includes:**
- Component hardware design
 - System design and performance simulation
 - System software design
 - Printed circuit board model
- Features, functions and context of engineering modelling include:**
- Techniques used for mechanical modelling
 - Sustainability implications of modelling
 - WHS and regulatory requirements related to modelling processes and materials
 - Model parameters, form, function and features, virtual or physical
 - Processes required which may include those for generating graphics, post-processing, and physical modelling
 - Required technical and professional assistance
- Post-processor**
- A post processor or code generator converts programmed instructions generated by computer-aided manufacture (CAM) software or computer-aided design (CAD) package into computer-numerically controlled (CNC) program code to control a machine tool
- Post-processing model for analysis or physical modelling includes:**
- Setting up component, system and system software models
 - Processing dimensional data to create 2-D or 3-D code for CAM operations, such as printed circuit board manufacture
- Rapid prototyping processes include:**
- A variety of rapid prototyping processes are available, including:
 - selective laser sintering (SLS) which uses thermoplastics and metal powders
 - fused deposition modeling (FDM) which uses thermoplastics and eutectic metals
 - stereolithography (SLA) which uses a photopolymer
 - laminated paper manufacturing (LOM) which uses paper
 - electron beam melting (EBM) which uses titanium alloys
 - 3-D printing (3DP) which uses a variety of materials
- Criteria for avionic designs include:**
- Safety and risk
 - Function
 - Aesthetics
 - Compliance with relevant regulations and standards

Appropriate technical and professional assistance includes:

- Manufacturability and maintainability
- Marketability
- Sustainability:
 - social, economic and environmental
 - material and energy resources
- Cost constraints
- Ergonomics, anthropometrics and physiology
- Facilities, plant and skills available
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorizations in the ADF regulatory system
- Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
- Engineers employed within organisations recognised by overseas airworthiness organisations

WHS, regulatory requirements and enterprise procedures

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- State and territory regulatory requirements applying to electrical work
- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, and European Aviation Safety Agency

Relevant standards include:

- AS 1100.101-1992 Technical drawing – General principles
- AS 1102.101-1989 Graphical symbols for electrotechnical documentation - General information and general index
- AS 61508.1-2011 Functional safety of electrical/electronic/ programmable electronic safety-related systems – General requirements
- AS/NZS 3947.3:2001 Low-voltage switchgear and control gear - Switches, disconnectors, switch-disconnectors and fuse-combination units

- AS/NZS ISO 31000 Set:2013 Risk Management Set
- DEF AUST Specifications applicable to avionics
- British Defence Standard 00-970 Design and Airworthiness Requirements for Service Aircraft
- US Military Specifications relevant to avionics
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- CASA AC 21-99 Aircraft Wiring and Bonding
- FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair
- Lumped parameter model
- Empirical, random data tested model
- Finite element analysis (FEA) software
- Model based design

Modelling and related software includes:

Unit Mapping Information

Release 1 – new unit based on and equivalent to MEM09154A Apply computer-aided modelling and data management techniques to avionic engineering designs

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA704 Apply avionic modelling for computer-aided engineering

Modification History

Release 1 - New unit of competency

Performance Evidence

- Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:
- investigating the uses of avionic models for hardware, system and software design
- reviewing features, functions and context of avionic modelling
- comparing available software, functions and features
- communicating, participating and negotiating with:
 - stakeholders, team, cross-function support groups and experts
 - appropriate licensed technicians and professionals
- performing modelling using a comprehensive range of techniques, such as:
 - creating and manipulating 3-D entities
 - using library files and adaptations
 - top down system simulation
- comparing available software, functions and features
- creating dimensioned orthographic projections from model
- extracting dimensional properties from model
- using post-processing model for analysis or physical modelling
- modelling avionic component and system hardware and software
- finalising modelling by:
 - completing work
 - gaining approval and commissioning work
 - providing documentation and reports as required
 - obtaining sign-off.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- engineering and market context for avionic component and systems modelling:
 - relative speed compared to traditional methods related to quantities
 - market demand speed, standardisation, quality and flexibility through data
- sustainability implications of modelling: economic, social and environmental

- avionic component models, including:
 - electric motors and electrically operated fluid power actuators
 - printed circuit boards
 - electrical and electronic systems components
 - chain drives, gear sets, pulley and belt drives
 - structural sections for component casings, racks and mounts to the aircraft structure
- avionic systems, including:
 - aircraft electrical power generation and distribution
 - control and indication for mechanical, fluid power and flight control systems
 - aircraft instrument systems
 - radio communication and navigation
 - pulse
 - data communications, including in-flight entertainment
- software functions and features:
 - modelling software
 - model analysis software (e.g. FEA)
 - post-processor, CNC/CAM and rapid prototyping
 - regulations relating to the design of avionic software
- model creation techniques, including:
 - using and manipulating coordinate systems
 - creating 3-D entities, ruled and revolved surfaces
 - creating solids, editing and combining solids
 - manipulating entities and solids
 - library files
 - manipulations of solids and library files
 - three dimensional graphics from models, including rotated views and sections
 - dimensioned orthographic representations from models
 - top down system simulation
 - construction of artwork for printed circuit boards
- typical modelling processes, including:
 - computer modelling
 - post-processing
 - prototyping and model manufacture
- virtual model options, such as automated systems simulation
- physical modelling options, including:
 - post-processing to create NC data files to CNC circuit board assembly
 - rapid prototyping options
- WHS requirements:

- WHS Act and regulation, which recognise that stakeholders in workplace activities include the workforce exposed to worksite conditions, materials and processes of the activity and also recognise the broader community exposed to environmental effects of the activity. Competence in designing for and implementation of the Act, regulations, codes, directives, risk management and standards is required by other units
- relevant standards that give guidance to complying with the WHS Act
- codes of practice, risk assessment and registration requirements
- requirement for licensed technical and professional services
- modelling compared to traditional methods, such as:
 - pen and pencil graphics compared to wire frame, surface and solid models
 - computer animations compared to transparent overlay mobiles to test clearances and motions
 - solid models compared to isometric representations
 - computer library files compared to the use of reference charts and catalogue information
- future developments in modelling and related engineering software:
 - new developments in computer aided engineering
 - dynamic response of models
 - new developments in rapid prototyping and manufacturing
- animations and simulations.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate competently and consistently:
 - review features, functions and context of avionic modelling
 - compare available software, functions and features
 - communicate, participate and negotiate with stakeholders, team, cross-function support groups and experts, appropriate licensed technicians and professionals
 - model using a comprehensive range of techniques

- create dimensioned orthographic projections from model
- extract dimensional properties from model
- post-process model for analysis or physical modelling
- complete work, commission and gain approval, document and report, and obtain sign-off
- identify future developments in modelling.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA705 Apply basic scientific principles and techniques in aeronautical engineering situations

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of basic aeronautical scientific principles and techniques as a member of a design and development team or similar in support of the design and development of aeronautical applications, or within the engineering department of an aircraft maintenance organisation.

Applications include identifying the range of basic aeronautical scientific principles and techniques relevant to aeronautical engineering, selecting aeronautical principles and techniques for particular applications, applying aeronautical principles and techniques to engineering tasks and quoting results appropriately.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEM23004A Apply technical mathematics

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes. Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Research and identify the range of basic scientific principles | 1.1 Research and report on the basic scientific principles relating to aeronautical engineering from appropriate sources of information and examination of |
|---|--|

	and techniques relevant to aeronautical engineering		applications
		1.2	Identify the basic aeronautical techniques and associated technologies, software and hardware required to implement scientific principles relating to aeronautical engineering situations
2.	Select basic aeronautical scientific principles and techniques relevant to particular aeronautical engineering applications	2.1	Select the relevant basic aeronautical scientific techniques and principles for particular aeronautical engineering situations
		2.2	Select the relevant basic aeronautical techniques and associated technologies, software and hardware for particular aeronautical engineering situations
3.	Apply the relevant basic aeronautical scientific principles and techniques appropriately	3.1	Apply the basic aeronautical scientific principles in a consistent and appropriate manner to obtain any required solution
		3.2	Use appropriate calculations and coherent units in the solution of engineering calculations
		3.3	Use significant figures in engineering calculations
		3.4	Apply the basic aeronautical techniques and associated technologies, software and hardware in a consistent and appropriate manner to obtain required solutions
4.	Quote the results of the application of the basic aeronautical scientific principles and basic techniques correctly	4.1	Quote the solution for applications involving engineering calculations in an appropriate style
		4.2	Quote the solution for applications not involving engineering calculations in an appropriate style

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Sources of information include:

- Reference texts
- Manufacturer catalogues and industry magazines
- International aerospace organisation publications
- Websites
- Use of phone, email and fax information gathering

Aeronautical engineering refers to:

- The engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace mechanical, hydraulic, pneumatic, fuel and fire products, processes, systems or services for civil and military applications

Relevant basic aeronautical scientific techniques and principles involves:

- The application of appropriate basic techniques (see below) supported by mathematical skills and introductory knowledge of scientific principles to design, manufacturing, commissioning and maintenance related tasks and projects relating to:
 - metal and composite structure
 - aerodynamic loads
 - stability, control and performance
 - mechanical systems and related components
 - hydraulic systems and related components
 - pneumatic systems and related components
 - air cycle air conditioning and pressurisation systems and related components
 - power plant systems and components
 - the application and interfacing of electrical and electronic system control
- The applications may require the use of one or two basic aeronautical scientific principles together with a fundamental mathematical calculation leading to process, resources and system choices from a limited range of options
- Basic techniques include:
 - basic hand and power tool operations
 - machining
 - fitting
 - welding
 - moulding
 - fabricating
 - wiring
 - programming techniques

Unit Mapping Information

Release 1 – supersedes and is equivalent to MEA349B Apply basic scientific principles and techniques in aeronautical engineering situations

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA705 Apply basic scientific principles and techniques in aeronautical engineering situations

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- selecting appropriate basic aeronautical scientific principles to suit specific applications
- selecting appropriate basic aeronautical techniques and associated technologies, software and hardware to suit specific applications
- applying basic aeronautical scientific principles to particular engineering situations
- applying and manipulate appropriate formulas for applications involving engineering calculations
- applying appropriate calculations to engineering situations
- checking the validity of equations in using dimensional analysis
- applying basic aeronautical techniques and associated technologies, software and hardware in a manner appropriate to the application and identified scientific principles
- referring solutions to the original aim of the application
- quoting solutions in appropriate units, using appropriate significant figures
- quoting limitations of solutions, due to assumptions, scientific principles and techniques used
- presenting solutions referring to the original aim of the application.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- basic aeronautical scientific principles, including:
 - statics, including analysis and application of:
 - forces and moments of forces
 - systems of concurrent and non-concurrent forces
 - dry sliding friction
 - dynamics, including analysis and application of:
 - Newton's Laws
 - kinematics and kinetics of uniformly accelerated linear motion
 - kinematics and kinetics of uniformly accelerated rotation

- curvilinear motion and centrifugal force
- work, energy, power and torque
- mechanical advantage and efficiency
- strength of materials:
 - axial tension and compression
 - direct shear
 - bolted, riveted, bonded and welded connections
 - shear in beams
 - bending stresses and bending deflections (by standard formulas only)
 - torsion
- aerodynamics:
 - Bernoulli's Theorem
 - the atmosphere
 - aerodynamic forces (lift, drag, weight and thrust)
 - stability and control (to a level not requiring the application of calculus)
 - airscrews and propulsion (to a level not requiring the application of calculus)
 - aircraft performance (to a level not requiring the application of calculus)
- fluid mechanics:
 - properties of fluids, including mineral and synthetic hydraulic fluids
 - fluid statics, Archimedes' Principle and Pascal's Principle
 - fluid flow – continuity and energy conservation
 - fluid power – pumps
- thermodynamics:
 - heat transfer principles (conduction, convection and radiation)
 - perfect gas laws
 - kinetic theory of gases
 - laws of thermodynamics
- control concepts including closed and open loop control
- electricity and electronics:
 - basic electrical concepts
 - Ohm's Law
 - Kirchhoff's Current and Voltage Laws
 - basic DC circuits
 - basic power supply, transformer, rectifier, filter and regulator
 - PLC concepts – I/O, timing, counting, programming
 - electronic devices (discrete) – resistors, diodes, capacitors, inductors, transistors and rectifiers
 - microprocessor concepts
- light, sound and vibration:
 - wave behavior – standing vs travelling waves, transverse and longitudinal

- light – reflection, absorption, refraction, diffraction, spectrum, infrared, visible, ultraviolet, transmission medium and engineering applications
- sound – pitch, frequency, intensity (power), decibel scale, ‘noise dose’, spectrum, infrasound, audible, ultrasound, speed, natural frequency, resonance, transmission medium and engineering applications
- vibration – sources, balancing, shaft alignment, measurement, damping and engineering applications
- basic aeronautical techniques and related technologies, software and hardware associated with implementing scientific principles in aeronautical engineering solutions
- the applicability and limitations of basic aeronautical scientific principles
- the applicability and limitations of basic aeronautical techniques and associated technologies, software and hardware
- appropriateness of calculations
- fundamental and derived quantities
- common systems of units
- the procedure for converting between systems of units
- common prefixes used with units and their values
- the procedure for carrying out dimensional analysis
- the concept of significant figures
- the uncertainty of computations based on experimental data
- the procedures for determining the significance of figures in calculations
- the procedures for estimating errors in derived quantities.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and explain the application of basic scientific principles and engineering techniques to aeronautical engineering situations

- for given aeronautical engineering situations, identify and apply the relevant basic scientific principles and techniques
- perform necessary calculations using appropriate applications and evaluate solutions
- document appropriately the outcome of application of basic scientific principles and techniques to given aeronautical engineering situations.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA706 Apply basic scientific principles and techniques in avionic engineering situations

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of basic avionic scientific principles and techniques as a member of a design and development team or similar in support of the design and development of avionic applications, or as a member of a maintenance organisation engineering department.

Applications include identifying the range of basic avionic scientific principles and techniques relevant to avionic engineering, selecting avionic principles and techniques for particular applications, applying avionic principles and techniques to engineering tasks, and quoting results appropriately.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEM23004A Apply technical mathematics

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|-----------------------|-----|---|
| 1. | Research and identify | 1.1 | Research appropriate sources of information |
|----|-----------------------|-----|---|

the range of basic scientific principles and techniques relevant to avionic engineering	1.2	Examine applications and report on the basic scientific principles relating to avionic engineering
	1.3	Identify basic avionic techniques and associated technologies, software and hardware required to implement scientific principles relating to avionic engineering situations
2. Select basic avionic scientific principles and techniques relevant to particular avionic engineering applications	2.1	Select the relevant basic avionic scientific techniques and principles for particular avionic engineering situations
	2.2	Select the relevant basic avionic techniques and associated technologies, software and hardware for particular avionic engineering situations
3. Apply the relevant basic avionic scientific principles and techniques	3.1	Apply the basic avionic scientific principles in a consistent and appropriate manner to obtain any required solution
	3.2	Use appropriate calculations and coherent units in the solution of engineering calculations
	3.3	Use significant figures in engineering calculations
	3.4	Apply the basic avionic techniques and associated technologies, software and hardware in a consistent and appropriate manner to obtain required solutions
4. Quote the results of the application of the basic avionic scientific principles and basic techniques	4.1	Use an appropriate style to quote solutions for applications involving engineering calculations
	4.2	Use an appropriate style to quote solutions for applications not involving engineering calculations

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Sources of information include:

- Reference texts
- Manufacturer catalogues and industry magazines
- International aerospace organisation publications
- Websites
- Use of phone, email and fax information gathering

Avionic engineering refers to:

- The engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace electrical, instrument, radio and electronic systems and components and related test equipment for civil and military applications

Basic avionic scientific techniques and principles involves:

- The application of appropriate basic techniques (see below) supported by their mathematical skills and introductory knowledge of scientific principles to design, manufacturing, commissioning and maintenance-related tasks and projects relating to:
 - electrical systems and related wiring and components (power generation, distribution, control interfaces with hydraulic and pneumatic systems, and caution and warning systems)
 - mechanical and electro-mechanical flight instruments and indication systems (quantity, pressure, temperature and position) and components
 - electronic systems and components (communications, radio navigation, pulse, display, automatic flight control, flight management and engine management)
 - automatic test stations, adapters and software
- The applications may require the use of one or two basic avionic scientific principles together with a fundamental mathematical calculation leading to process, resources and system choices from a limited range of options.
- Basic techniques include:
 - basic hand and power tool operations
 - machining
 - fitting
 - welding
 - moulding
 - fabricating
 - wiring
 - programming techniques

Unit Mapping Information

Release 1 – supersedes and is equivalent to MEA272B Apply basic scientific principles and techniques in avionic engineering situations

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA706 Apply basic scientific principles and techniques in avionic engineering situations

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- selecting appropriate basic avionic scientific principles to suit specific applications
- selecting appropriate basic avionic techniques and associated technologies, software and hardware to suit specific applications
- applying basic avionic scientific principles to particular engineering situations
- applying and manipulating appropriate formulas for applications involving engineering calculations
- applying appropriate calculations to engineering situations
- checking the validity of equations using dimensional analysis
- applying basic avionic techniques and associated technologies, software and hardware in a manner appropriate to the application and identified scientific principles
- referring solutions to the original aim of the application
- quoting solutions in appropriate units, using appropriate significant figures
- quoting limitations of solutions, due to assumptions, scientific principles and techniques used
- presenting solutions referring to the original aim of the application.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- physics for electronics:
 - units and measurements
 - magnetic force
 - vectors
 - electric fields and potential
 - electric current and resistance
 - capacitance
 - work, power and energy
- analogue electronics:

- negative feedback amplifiers
- differential amplifiers
- operational amplifiers
- amplifier frequency response
- thermal circuits/heat exchangers
- active filters
- fault-finding
- digital electronics:
 - characteristics of digital systems
 - number systems
 - Boolean algebra
 - logic circuits
 - logic families
 - construction and testing techniques
 - flip flop circuits
 - analogue to digital conversion
 - digital to analogue conversion
 - timing and control
 - combinational logic circuits
- circuit theory:
 - Kirchhoff's Current and Voltage Laws
 - Thevenin's Network Theorem
 - Norton's Network Theorem
 - Superposition Network Theorem
 - inductance, capacitance and resistance (LCR) series circuit analysis
 - LCR parallel circuit analysis
 - series and parallel resonance
- electrical systems:
 - DC and AC circuit design principles
 - generators and motors
 - inverters
 - power supply, transformer, rectifier, filter and regulator
 - solenoids
 - circuit protection
 - wiring cables and looms
- aerodynamics:
 - Bernoulli's Theorem
 - the atmosphere
 - aerodynamic forces (lift, drag, weight and thrust)
 - stability and control (to a level not requiring the application of calculus)

- thermodynamics – heat transfer principles (conduction, convection and radiation)
- instruments:
 - airspeed measurement
 - altitude measurement
 - attitude indication
 - measurement of quantity, flow, temperature, pressure and position
- control concepts and data communications:
 - servo and synchronous systems and components
 - data communication definitions and terminology
- communications:
 - radio transmission and modulation
 - radio reception
 - microphones, amplifiers and speakers
 - transmission lines and antennas
- pulse:
 - antennas
 - waveguides
 - transmitters/receivers
 - displays
- light, sound and vibration:
 - wave behaviour – standing vs travelling waves, transverse and longitudinal
 - light – reflection, absorption, refraction, diffraction, spectrum, infrared, visible, ultraviolet (UV), transmission medium and engineering applications
 - sound – pitch, frequency, intensity (power), decibel scale, ‘noise dose’, spectrum, infrasound, audible, ultrasound, speed, natural frequency, resonance, transmission medium and engineering applications
 - vibration – sources, balancing, shaft alignment, measurement, damping and engineering applications
- appropriateness of calculations
- fundamental and derived quantities
- the procedure for carrying out dimensional analysis
- the concept of significant figures
- the uncertainty of computations based on experimental data
- the procedures for determining the significance of figures in calculations
- the procedures for estimating errors in derived quantities.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.

- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and explain the application of basic scientific principles and engineering techniques to avionic engineering situations
 - for given avionic engineering situations, identify and apply the relevant basic scientific principles and techniques
 - perform necessary calculations using appropriate applications and evaluate solutions
 - document appropriately the outcome of application of basic scientific principles and techniques to given avionic engineering situations.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A707 Select and test aeronautical engineering materials

Modification History

Release 1 - New unit of competency

Application

Applications of this unit of competency include selecting engineering materials and materials tests, sourcing materials data; ensuring appropriate performance and physical standards for aeronautical applications; documenting materials tests, ensured calibration standards; interpreting and documenting materials data sheets as appropriate for mass production, batch production, jobbing shop, and prototyping applications.

Activities may be performed as a member of a design and development or engineering support team.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Engineering science

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|---|
| 1. Identify classes of materials, based on properties and materials tests relevant to aeronautical engineering | 1.1 Identify classes of materials, based on properties, required for particular aeronautical engineering applications |
| | 1.2 Relate material properties to common production and construction methods and processes |
| | 1.3 Identify common characteristics, faults or flaws in |

- materials and components or product in particular engineering applications
- 1.4 Identify test methods for materials and components or product in particular engineering applications
 - 1.5 Identify specific industrial test standards/codes, calibration requirements, regulations and authorities related to selection of materials and products for particular engineering applications
 - 1.6 Investigate the role of Australia's national measurement system
2. Identify and use sources of information on engineering materials, materials tests and test equipment
 - 2.1 Identify and use appropriate sources of information on materials
 - 2.2 Identify and use appropriate sources of information on methods of testing of properties of materials to ensure suitability for a particular application
 - 2.3 Identify and use appropriate sources of information on materials, materials tests, test calibration, test certificates, regulations, standards, standards councils/societies/authorities/regulatory bodies
 - 2.4 Investigate and report on the use of standards and codes
 - 2.5 Identify and use appropriate sources of information on material safety data sheets (MSDS)
 3. Specify and implement materials for particular aeronautical engineering applications
 - 3.1 Select materials for use in given aeronautical engineering applications based on relevant test information
 - 3.2 Incorporate materials and components into aeronautical processes in accordance with design functional requirements
 4. Specify and implement methods used to test or obtain the properties of engineering materials
 - 4.1 Specify and implement tests of materials to ensure quality, safety or suitability for a range of applications
 - 4.2 Ensure traceability of measurement standard
 - 4.3 Obtain test sheets/certificates for appropriate materials for applications in accordance with organisational procedures and/or codes and regulations

- | | | |
|----|---|---|
| | 4.4 | Obtain appropriate MSDS for applications in accordance with organisational procedures and/or codes and regulations |
| 5. | Report on and record materials design data and methods and results of materials tests | 5.1 Report and record materials selections against design functional requirements in accordance with organisational procedures, codes and regulations, including environmental impact and sustainability assessment |
| | 5.2 | Report and record materials tests and test sheets/certificates in accordance with organisational procedures, codes and regulations |
| | 5.3 | Ensure appropriate calibration and traceability |
| | 5.4 | Report and record appropriate MSDS for applications in accordance with organisational procedures, codes and regulations |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Classes of materials include:**
- Non-ferrous metals and alloys - copper, aluminium, zinc, lead, tin, titanium and their alloys
 - Ferrous metals - carbon steels, alloy steels and cast irons
 - Non-metallic - composite materials, bearing materials, lubricants, ceramics, polymers and fabrics, adhesives
 - Electrical insulation materials, thermal conductors and insulators, electrical conductors, semiconductors and insulators
- Properties of materials include:**
- Strength, elasticity, plasticity, malleability, toughness, brittleness, fatigue endurance, mouldability, weldability, machinability, formability, resistance to creep and stress relaxation, resistance to degradation (e.g. use of plastic

fillers to enhance UV resistance), adhesion; electrical, magnetic, thermal, chemical and optical; material structure and effect on properties, flammability of fabrics

Other factors include:

- Corrosion and corrosion protection methods
- Aging of metals and fatigue
- The effect of manufacturing and construction processes on material properties (e.g. effect of heat treatment on corrosion resistance and fatigue properties, hydrogen embrittlement, shot peening of surfaces)
- The effect of property enhancement on design (e.g. adhesives plus sintering replacing some forging and machining of gears on shafts)
- Lay-up methods for composite structures
- Costs, such as manufacture of material, source of material, and typical applications and possibilities

Aeronautical engineering refers to:

- The engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace mechanical, hydraulic, pneumatic, fuel and fire products, processes, systems or services for civil and military applications

Australia's national measurement system includes:

- National Measurement Institute (NMI)
- National Association of Testing Authorities
- Standards Australia
- Joint Accreditation System of Australia and New Zealand

Sources of information include:

- Reference texts
- Manufacturer's catalogues and industrial magazines
- Websites
- Use of phone, email and fax information gathering

Standards councils/societies/ authorities/regulatory bodies include:

- Australian Standards (AS)
- American Society of Testing and Materials (ASTM)
- US Military Specification (MIL Spec.)
- American Society of Manufacturing Engineers (ASME)
- International Standards Organisation (ISO)
- CASA
- ADF
- United States Federal Aviation Authority
- European Aviation Safety Agency

Standards and codes include:

- Non-destructive testing (NDT) and mechanical test standards
- Chemical test standards

- Tests of materials include:**
- Electrical test standards
 - Compliance test standards for components
 - Destructive, including tensile, compression, impact, hardness, fatigue, corrosion, stress relaxation and creep, and peel resistance (adhesives)
 - Non-destructive, including hardness, ultrasonics, X-ray, magnetic particle, dye penetrant, eddy current, surface friction, conductivity, heat expansion, photoelastic, heat capacity refractive index and magnetic hysteresis loop
- Traceability includes:**
- Test calibrations that can be traced back to the relevant base unit in the relevant measurement system

Unit Mapping Information

Release 1 – supersedes and is equivalent to MEA350A Select and test aeronautical engineering materials

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA707 Select and test aeronautical engineering materials

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- selecting class of materials for an application based on comparison of properties for a significant range of materials classes
- selecting class of materials for an application suitable to production and construction methods and processes
- identifying, overcoming or compensating for common characteristics, faults or flaws in materials or product
- identifying test methods for materials and components, specific industrial test standards and regulations for particular engineering applications
- identifying test methods for faults or flaws in materials and components or product
- selecting materials following an extensive search of appropriate sources of information, including manufacturer's catalogues and websites
- selecting appropriate tests from a range of possible tests, following an extensive search of appropriate sources of information, including manufacturer's catalogues and websites
- satisfying applicable standards and regulations for materials and components
- sourcing materials test certificates and using the material properties information from them
- sourcing, obtaining and implementing MSDS
- implementing tests correctly for materials and component faults and properties of materials
- selecting test methods appropriate to applications
- obtaining appropriate test sheets/certificates for applications
- completing reports, records and design documentation
- addressing environmental impact and sustainability issues
- reporting, recording and filing test reports and documentation
- implementing materials tests and test sheets/certificates, test calibration and traceability.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- properties of materials classes
- the effect of material properties on production and construction methods and processes
- the effect of characteristics, faults or flaws in materials on product and processes
- test methods for materials and components, specific industrial test standards, regulations and authorities related to particular engineering applications
- test methods for faults or flaws in materials and components or product
- methods of accessing and using alternative information sources
- test procedures and typical applications for tests
- sources and uses of information on materials, materials tests, test certificates, regulations, standards, regulatory bodies and industrial authorities
- methods of accessing MSDS and their relevance to procedures
- identification of materials for an application based on comparison of properties of materials
- identification of test for an application based on an understanding of its ability to measure specific material or product properties
- significance of test sheets/certificates to applications
- the need for obtaining and filing test sheets/certificates
- materials selections in relation to design functional requirements
- environmental impact and sustainability assessment
- significance of test reports and documentation to applications
- significance of reporting and recording procedures
- significance of materials tests and test sheets/certificates, test calibration and traceability
- significance of reporting and recording procedures.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify classes of materials for specific aeronautical engineering situations and specify by material specification

- identify testing requirements for selected materials and applicable organisations for the conduct of tests
- identify and specify processes required to achieve required material properties
- obtain and apply relevant MSDS
- ensure that material manufacturing and test records meet regulatory requirements.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A708 Select and test avionic engineering materials

Modification History

Release 1 - New unit of competency

Application

Applications of this unit of competency include selecting engineering materials and materials tests, sourcing materials data; ensuring appropriate performance and physical standards for avionic applications; documenting materials tests, ensured calibration standards; interpreting and documenting materials data sheets as appropriate for mass production, batch production, jobbing shop, and prototyping applications.

Activities may be performed as a member of a design and development or engineering support team.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

Competency Field

Engineering science

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Identify classes of materials, based on properties and materials tests relevant to avionic engineering | 1.1 Identify classes of materials, based on properties, required for particular avionic engineering applications |
| | 1.2 Relate material properties to common production and construction methods and processes |
| | 1.3 Identify common characteristics, faults or flaws in materials and components or product in particular engineering applications |

- | | | |
|----|--|--|
| | 1.4 | Identify test methods for materials and components or product in particular engineering applications |
| | 1.5 | Identify specific industrial test standards/codes, calibration requirements, regulations and authorities related to selection of materials and products for particular engineering applications |
| | 1.6 | Investigate the role of Australia's national measurement system |
| 2. | Identify and use sources of information on engineering materials, materials tests and test equipment | 2.1 Identify and use appropriate sources of information on materials |
| | 2.2 | Identify and use appropriate sources of information on methods of testing of properties of materials to ensure suitability for a particular application |
| | 2.3 | Identify and use appropriate sources of information on materials, materials tests, test calibration, test certificates, regulations, standards, and standards councils/societies/authorities/regulatory bodies |
| | 2.4 | Investigate and report on the use of standards and codes |
| | 2.5 | Identify and use appropriate sources of information on material safety data sheets (MSDS) |
| 3. | Specify and implement materials for particular avionic engineering applications | 3.1 Select materials in given avionic engineering applications based on relevant test information |
| | 3.2 | Incorporate materials and components into avionic and manufacturing processes in accordance with design functional requirements |
| 4. | Specify and implement methods used to test or obtain the properties of engineering materials | 4.1 Specify and implement tests of materials to ensure quality, safety or suitability for a range of applications |
| | 4.2 | Ensure traceability of measurement standard |
| | 4.3 | Obtain test sheets/certificates for appropriate materials for applications in accordance with organisational procedures and/or codes and regulations |
| | 4.4 | Obtain appropriate MSDS for applications in accordance with organisational procedures and/or codes and regulations |
| 5. | Report on and record | 5.1 Report and record materials selections against design |

materials design data and methods and results of materials tests

functional requirements in accordance with organisational procedures, codes and regulations, including environmental impact and sustainability assessment

- 5.2 Report and record materials tests and test sheets/certificates in accordance with organisational procedures, codes and regulations
- 5.3 Ensure appropriate calibration and traceability
- 5.4 Report and record appropriate MSDS for applications in accordance with organisational procedures, codes and regulations

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Classes of materials include:

- Non-ferrous metals and alloys - copper, aluminium, zinc, lead, tin, titanium and their alloys
- Ferrous metals - carbon steels, alloy steels and cast irons
- Non-metallic - composite materials, bearing materials, lubricants, ceramics, polymers and fabrics, and adhesives
- Electrical and electronic - electrical insulation materials; thermal conductors and insulators; electrical conductors, including gold and silver; semiconductors and insulators; and printed circuit board matrix materials

Properties of materials include:

- Strength, elasticity, plasticity, malleability, toughness, brittleness, fatigue endurance, mouldability, weldability, machinability, formability, resistance to creep and stress relaxation, resistance to degradation (e.g. use of plastic fillers to enhance UV resistance), adhesion, electrical, magnetic, thermal, chemical and optical, material structure and effect on properties

Other factors include:

- Corrosion and corrosion protection methods.
- The effect of manufacturing and construction processes

- on material properties.
- The effect of property enhancement on design (e.g. adhesives plus sintering replacing some forging and machining of gears on shafts)
 - Manufacture of material and source of material
 - Typical applications and possibilities
- Costs include:**
- The engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace electrical, instrument, radio and electronic systems and components and related test equipment for civil and military applications
- Avionic engineering refers to:**
- National Measurement Institute (NMI)
 - National Association of Testing Authorities
 - Standards Australia
 - Joint Accreditation System of Australia and New Zealand
- Australia's national measurement system includes:**
- Reference texts
 - Manufacturer's catalogues and industrial magazines
 - Websites
 - Use of phone, email and fax information gathering
- Sources of information include:**
- Australian Standards (AS)
 - American Society of Testing and Materials (ASTM)
 - US Military Specification (MIL Spec.)
 - American Society of Manufacturing Engineers (ASME)
 - International Standards Organisation (ISO)
 - CASA
 - ADF
 - United States Federal Aviation Authority
 - European Aviation Safety Authority
- Standards councils/societies/authorities/regulatory bodies include:**
- Non-destructive testing (NDT) and mechanical test standards
 - Chemical test standards
 - Electrical test standards
 - Compliance test standards for components
- Standards and codes include:**
- Destructive, including tensile, compression, impact, hardness, fatigue, corrosion, stress relaxation and creep, and peel resistance (adhesives)
 - Non-destructive, including hardness, ultrasonics, X-ray, magnetic particle, dye penetrant, eddy current, surface friction, conductivity, heat expansion, photoelastic, heat capacity refractive index, and magnetic hysteresis loop
- Tests of materials include:**

- Traceability includes:**
- Test calibrations that can be traced back to the relevant base unit in the relevant measurement system

Unit Mapping Information

Release 1 – supersedes and is equivalent to MEA273A Select and test avionic engineering materials

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA708 Select and test avionic engineering materials

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- selecting class of materials for an application based on comparison of properties for a significant range of materials classes
- selecting class of materials for an application suitable to production and construction methods and processes
- identifying, overcoming or compensating for common characteristics, faults or flaws in materials or product
- obtaining appropriate test sheets/certificates for applications
- completing reports, records and design documentation
- addressing environmental impact and sustainability issues
- reporting, recording and filing test reports and documentation
- implementing materials tests and test sheets/certificates, test calibration and traceability
- identifying test methods for materials and components, specific industrial test standards and regulations for particular engineering applications
- identifying test methods for faults or flaws in materials and components or product
- selecting materials following an extensive search of appropriate sources of information, including manufacturer's catalogues and websites
- selecting appropriate tests from a range of possible tests, following an extensive search of appropriate sources of information, including manufacturer's catalogues and websites
- satisfying applicable standards and regulations for materials and components
- sourcing materials test certificates and using the material properties information from them
- sourcing, obtaining and implementing MSDS
- implementing tests correctly for materials and component faults and properties of materials
- selecting testing methods appropriate to applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- properties of materials classes
- the effect of material properties on production and construction methods and processes
- the effect of characteristics, faults or flaws in materials on product and processes
- test methods for materials and components, specific industrial test standards, regulations and authorities related to particular engineering applications
- test methods for faults or flaws in materials and components or product
- methods of accessing and using alternative information sources
- test procedures and typical applications for tests
- sources and uses of information on materials, materials tests, test certificates, regulations, standards, regulatory bodies and industrial authorities
- methods of accessing MSDS and their significance to applications
- identification of materials for an application based on comparison of properties of materials
- identification of test for an application based on an understanding of its ability to measure specific material or product properties
- significance of test sheets / certificates to applications
- the need for obtaining and filing test sheets / certificates
- materials selections in relation to design functional requirements
- environmental impact and sustainability assessment
- significance of test reports and documentation to applications
- significance of reporting and recording procedures
- significance of materials tests and test sheets/certificates, test calibration and traceability
- significance of reporting and recording procedures.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify classes of materials for specific avionic engineering situations and specify by material specification

- identify testing requirements for selected materials and applicable organisations for the conduct of tests
- identify and specify processes required to achieve required material properties
- obtain and apply relevant MSDS
- ensure that material manufacturing and test records meet regulatory requirements
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA709 Apply aeronautical structure design techniques

Modification History

Release 1 - New unit of competency

Application

This unit of competency covers the skills needed to contribute to the design of aircraft structure and structural components, including modifications and repairs. It includes performance of the design process within the requirements of airworthiness regulators and documentation of the design process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working within aircraft design teams or maintenance support engineering organisations and those pursuing careers and qualifications in aeronautical engineering at the paraprofessional level.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA701	Produce aeronautical engineering related graphics
MEA703	Apply aeronautical modelling for computer-aided engineering
MEA705	Apply basic scientific principles and techniques in aeronautical engineering situations
MEA707	Select and test aeronautical engineering materials
MEM23004A	Apply technical mathematics
MEM23007A	Apply calculus to engineering tasks

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|----|---|-----|--|
| 1. | Investigate requirements of aeronautical structural design projects | 1.1 | Review the context and negotiate parameters of the engineering design brief in consultation with stakeholders |
| | | 1.2 | Determine engineering scientific principles and design techniques required for design process |
| | | 1.3 | Investigate life-cycle design and sustainability implications of aeronautical structural design |
| | | 1.4 | Determine specification, documentation and graphical techniques required to define designs |
| | | 1.5 | Confirm work health and safety (WHS), regulatory requirements, codes of practice, standards, risk management and registration requirements relevant to aircraft structure design project |
| | | 1.6 | Investigate the need for technical and professional assistance |
| 2. | Apply aeronautical structural design techniques | 2.1 | Plan, schedule and coordinate the design task |
| | | 2.2 | Apply the design process and aeronautical scientific principles to component selection and design proposals |
| | | 2.3 | Create adequate and accurate calculations, preliminary graphics and maintain design process records |
| | | 2.4 | Evaluate multiple solutions against design criteria, risk, sustainability and cost |
| | | 2.5 | Apply systems thinking to problem solving and decision making in dealing with contingencies and constraints for continuous improvement and development of design options |
| | | 2.6 | Incorporate professional and technical assistance as required |

- | | | |
|----|----------------|--|
| | 2.7 | Apply specification, documentation and graphical techniques modelling, mock-up or prototyping techniques to define designs |
| 3. | Report results | 3.1 Report results of investigations, application and development of design |
| | 3.2 | Provide documentation and records generated in the design process |
| | 3.3 | Provide draft documentation required by CM plan and/or ILS process, where applicable |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aeronautical engineering refers to:

- The engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace structure, mechanical, hydraulic, pneumatic, fuel and fire products, processes, systems or services for civil and military applications

Aircraft structure and structural components include:

- All primary, secondary and tertiary structures that may be made from metal or fibre composite

Context of engineering design activity includes:

- Competitive market
- Geo political factors, such as access to materials and markets
- Technological advantage/disadvantage
- Resources supply: materials, labour and skills
- Sustainability issues relevant to design task, including
 - social, economic and environmental considerations
 - material and energy resources
- WHS, risk, and applicable standards and code

- requirements
 - Regulatory requirements and procedures associated with design, modification and repair of aircraft structure and structural components
- Planning processes include:**
- Establishing design parameters and design criteria
 - Contributing to the negotiation and advice process
 - Preliminary planning, design investigations and costing
 - Identifying design, development, prototyping activities and skills requirements
 - Planning and scheduling design activities
 - Improving, adjusting, rescheduling as required by emergency contingencies and constraints
- Design process includes:**
- Establishing design parameters and criteria
 - Researching, measuring, experimenting and investigating
 - Generating ideas
 - Synthesis, problem solving, decision making and addressing constraints
 - Applying scientific principles, calculation and graphics, prototyping and mock-up techniques
 - Evaluating solutions against design criteria
 - Consultation, adjustments and agreement
 - Finalising design and sign-off
- Design criteria includes:**
- Regulatory requirements and associated standards
 - Function
 - Aesthetics
 - Manufacturability and maintainability
 - Marketability
 - Sustainability:
 - social, economic and environmental
 - material and energy resources
 - Cost constraints
 - Ergonomics and anthropometrics and physiology
 - Facilities, plant and skills available
 - Safety and risk
- Design analysis includes:**
- Static and dynamic analysis of loads
 - The stresses and deformations resulting
 - Graphical and mathematical methods and software options
- Design application (under professional engineer guidance) includes:**
- Design of structure and structural components
 - Design of structural modifications
 - Design of repair schemes

- Extension of published repair schemes
 - Extension of corrosion removal limits
- Configuration management (CM)**
- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life
- Integrated logistic support (ILS)**
- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface
- Sustainability considerations include:**
- Resources and energy required for design
 - Life-cycle design of product (manufacture to remanufacture or recycle)
 - Environmental considerations in manufacturing and operation of design, including:
 - raw material, solids and hazardous waste, and production by-products
 - potential contamination of land, air and stormwater pollutants, and discharge to sewerage
 - Carbon pollution and reduction effects
- Prototyping includes:**
- Any combination of:
 - mock-ups
 - physical and virtual modelling with post-processing for computer-numerically controlled (CNC) and rapid prototyping
- Systems thinking includes:**
- The process of developing solutions within the context of an entire system
 - Recognising that an improvement in one subsystem can adversely affect another subsystem
- Appropriate technical and professional assistance**
- Assistance from individuals with CASA maintenance certification licences or those with supervisory

includes:

- authorisations in the ADF regulatory system
- Professional support from engineers employed within:
 - organisations with CASA design, continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
- Engineers employed within organisations recognised by overseas airworthiness organisations

WHS, regulatory requirements and enterprise procedures include:

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- State and territory regulatory requirements applying to electrical work
- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Relevant standards include:

- AS 1100.101-1992 Technical drawing – General principles
- AS 4024.1-2006 Series Safety of machinery
- AS/NZS ISO 31000 Set:2013 Risk Management Set
- British Defence Standard 00-970 Design and Airworthiness Requirements for Service Aircraft
- US Military Specifications and Standards relevant to aircraft design
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- CASA AC 21-99 Aircraft Wiring and Bonding
- FAA AC 43-13-1B Acceptable Methods, Techniques

- and Practices – Aircraft Inspection and Repair
- AC21-15(1) Supplemental Type Certificates
 - AC21.16(0) Approval of Materials, Parts, Processes and Appliances
 - AC21.14 Production Certificates
 - AC21.20 Production Under a Type Certificate Only
 - AC21.27 Manufacturing Approval – Overview
 - AC21.145(0) Manufacture of Parts During the Course of Maintenance
 - AC21-601(0) Australian Technical Standard Order
 - CAAP35-7(0) Design Approval of Modifications and Repairs

Unit Mapping Information

Release 1 – new unit based on but not equivalent to MEM14065A Plan and design aeronautical engineering projects

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA709 Apply aeronautical structure design techniques

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- communicating, negotiating and reviewing context and parameters of the engineering design brief with stakeholders
- determining or confirming scientific principles and design techniques, WHS and regulatory requirements, and design specification requirements
- evaluating multiple solutions against design criteria, risk, sustainability and cost
- investigating life-cycle design and sustainability, technical and professional assistance required
- investigating and applying CM and ILS requirements
- planning, scheduling and coordinating the design task
- applying design process and scientific principles to structure and structural component design proposals, including modifications and repairs to existing structure
- solving problems and making decisions with systems thinking for contingencies and constraints, including airworthiness regulatory requirements and continuous improvement (may be requirements of CM and ILS)
- defining designs, specifying, documenting and applying graphical techniques, modelling, mock-up or prototyping techniques
- creating and maintaining adequate and accurate calculations and design process records
- reporting and documenting results of investigations, application of principles and techniques, calculations, specifications, diagrams, computer-aided design (CAD) files, mock-ups or prototypes of designs
- complying with regulatory procedures for design, modification and repair approval.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- life-cycle design and sustainability implications of aircraft structure designs (may be part of CM and ILS procedures)
- design processes and techniques to investigate, synthesise and develop proposals, evaluate feasibility against design criteria, review and revise in consultation with stakeholders, model, mock-up and prototype

- systems thinking, problem solving and decision making, and continuous improvement methods
- application of CM and ILS procedures
- WHS and regulatory requirements, codes of practice, standards, risk management and registration requirements
- The roles and relevance to the design process of professional and technical assistance for engineering specialisations
- procedures for planning, scheduling and coordination of design
- hardware requirements of typical aircraft structure and structural components
- engineering scientific principles required for design analysis
- design calculations techniques
- application of software for product planning and design, such as CAD, stress analysis and mould design and project management
- required documentation, including:
 - design brief and records of negotiation
 - planning and schedule
 - calculations and diagrams documentation for checking and design records
 - specifications and graphics required to define designs
 - risk analysis report
 - design process summary report
 - life cycle and sustainability reports
 - CM and ILS documentation
 - documentation required by Regulators for approval of designs, modifications and repairs
- prototyping options, including mock-ups, physical and virtual modelling, and rapid prototyping.

Assessment Conditions

- 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 a simulated working environment 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.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.

- Assessors must be satisfied that the candidate can competently and consistently:
 - communicate, negotiate and review design brief with stakeholders
 - determine or confirm scientific principles and design techniques, WHS and regulatory requirements, and design specification requirements
 - evaluate multiple solutions
 - apply CM and ILS requirements
 - investigate life-cycle design and sustainability, technical and professional assistance required
 - plan, schedule and coordinate the design task
 - select design components using design process and scientific principles
 - solve problems and make decisions with systems thinking for contingencies and constraints and continuous improvement
 - define designs, specify and document and apply graphical techniques, modelling, mock-up or prototyping techniques
 - create and maintain adequate and accurate calculations and design process records
 - report and document, results and processes
 - follow regulatory requirements and procedures for design, modification or repair procedures.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A710 Apply aeronautical system design techniques

Modification History

Release 1 - New unit of competency

Application

This unit of competency covers the skills needed to contribute to the design of aircraft systems (mechanical, hydraulic, pneumatic and fuel distribution and supply systems), including modifications. It includes performance of the design process within the requirements of airworthiness regulators and documentation of the design process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working within aircraft design teams or in maintenance support engineering organisations and those pursuing careers and qualifications in aeronautical engineering at the paraprofessional level.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A701	Produce aeronautical engineering related graphics
ME A703	Apply aeronautical modelling for computer-aided engineering
ME A705	Apply basic scientific principles and techniques in aeronautical engineering situations
MEM23004A	Apply technical mathematics

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|--|--|
| 1. Investigate requirements of aeronautical system design projects | <ul style="list-style-type: none"> 1.1 Review the context and negotiate parameters of the engineering design brief in consultation with stakeholders 1.2 Determine engineering scientific principles and design techniques required for design process 1.3 Investigate life-cycle design and sustainability implications of aeronautical system design 1.4 Determine specification, documentation and graphical techniques required to define designs 1.5 Confirm work health and safety (WHS), regulatory requirements, codes of practice, standards, risk management and registration requirements relevant to aircraft system design project 1.6 Investigate the need for technical and professional assistance |
| 2. Apply aeronautical system design techniques | <ul style="list-style-type: none"> 2.1 Plan, schedule and coordinate the design task 2.2 Apply the design process and aeronautical scientific principles to component selection and design proposals 2.3 Create adequate and accurate calculations, preliminary graphics and maintain design process records 2.4 Evaluate multiple solutions against design criteria, risk, sustainability and cost 2.5 Select system components and hardware 2.6 Apply systems thinking to problem solving and decision making in dealing with contingencies and constraints for continuous improvement and development of design options 2.7 Incorporate professional and technical assistance as |

		required
	2.8	Apply specification, documentation and graphical techniques modelling, mock-up or prototyping techniques to define designs
3.	Report results	3.1 Report results of investigations, application and development of design
		3.2 Provide documentation and records generated in the design process
		3.3 Provide draft documentation required by CM plan and/or ILS process, where applicable

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aeronautical engineering refers to:

- The engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace structure, mechanical, hydraulic, pneumatic, fuel and fire products, processes, systems or services for civil and military applications.

Aircraft systems include:

- Mechanical systems
- Hydraulic systems
- Pneumatic systems
- Fuel distribution and supply systems
- Electrical and electronic system control interfaces

Context of engineering design activity includes:

- Competitive market
- Geo political factors, such as access to materials and markets
- Technological advantage/disadvantage
- Resources supply: materials, labour and skills
- Sustainability issues relevant to design task, including

- social, economic and environmental considerations
 - material and energy resources
 - WHS, risk, and applicable standards and code requirements
 - Regulatory requirements and procedures associated with design and modification of aircraft systems
- Planning processes include:**
- Establishing design parameters and design criteria
 - Contributing to the negotiation and advice process
 - Preliminary planning, design investigations and costing
 - Identifying design, development, prototyping activities and skills requirements
 - Planning and scheduling design activities
 - Improving, adjusting, rescheduling as required by emergency contingencies and constraints
- Design process includes:**
- Establishing design parameters and criteria
 - Researching, measuring, experimenting and investigating
 - Generating ideas
 - Synthesis, problem solving and decision making, addressing constraints
 - Applying scientific principles, calculation and graphics, prototyping and mock-up techniques
 - Evaluating solutions against design criteria
 - Consultation, adjustments and agreement
 - Finalise design and sign-off
- Design criteria includes:**
- Regulatory requirements and associated standards
 - Function
 - Aesthetics
 - Selection of system components
 - Manufacturability, maintainability
 - Marketability
 - Sustainability:
 - social, economic and environmental
 - material and energy resources
 - cost constraints
 - Ergonomics and anthropometrics and physiology
 - Facilities, plant and skills available
 - Safety and risk
- Design analysis includes:**
- System layout and selection of control media
 - Integration of components into the system
 - System and components performance against specified standards/specifications and regulatory requirements
 - System/component reliability and maintainability against

- specified standards/specifications and regulatory requirements
- Graphical and mathematical methods and software options
- Configuration management (CM)**
- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life.
- Integrated logistic support (ILS)**
- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface
- Sustainability considerations include:**
- Resources and energy required for design:
 - Life-cycle design of product (manufacture to remanufacture or recycle)
 - Environmental considerations in manufacturing and operation of design:
 - raw material, solids and hazardous waste, and production by-products
 - potential contamination of land, air and stormwater pollutants, and discharge to sewerage
 - carbon pollution and reduction effects
- Prototyping includes:**
- Any combination of:
 - mock-ups
 - physical and virtual modelling with post-processing for computer-numerically controlled (CNC) and rapid prototyping
- Systems thinking includes:**
- The process of developing solutions within the context of an entire system
 - Recognising that an improvement in one subsystem can adversely affect another subsystem

Appropriate technical and professional assistance includes:

- Assistance from individuals with CASA maintenance certification licences or those with supervisory authorisations in the ADF regulatory system
- Professional support from engineers employed within:
 - organisations with CASA design, continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
- Engineers employed within organisations recognised by overseas airworthiness organisations

WHS, regulatory requirements and enterprise procedures include:

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- State and territory regulatory requirements applying to electrical work
- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Relevant standards include:

- AS 1100.101-1992 Technical drawing – General principles
- AS 4024.1-2006 Series Safety of machinery
- AS/NZS ISO 31000 Set:2013 Risk Management Set
- British Defence Standard 00-970 Design and Airworthiness Requirements for Service Aircraft
- US Military Specifications and Standards relevant to aircraft design
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- CASA AC 21-99 Aircraft Wiring and Bonding

- FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair
- AC21-15(1) Supplemental Type Certificates
- AC21.16(0) Approval of Materials, Parts, Processes and Appliances
- AC21.14 Production Certificates
- AC21.20 Production Under a Type Certificate Only
- AC21.27 Manufacturing Approval – Overview
- AC21.145(0) Manufacture of Parts During the Course of Maintenance
- AC21-601(0) Australian Technical Standard Order
- CAAP35-7(0) Design Approval of Modifications and Repairs

Unit Mapping Information

Release 1 – new unit based on MEM14065A Plan and design aeronautical engineering projects – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA710 Apply aeronautical system design techniques

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and include:

- communicating, negotiating and reviewing context and parameters of the engineering design brief with stakeholders
- determining or confirming scientific principles and design techniques, WHS and regulatory requirements, and design specification requirements
- evaluating multiple solutions against design criteria, risk, sustainability and cost
- investigating life-cycle design and sustainability, technical and professional assistance required
- investigating and applying CM and ILS requirements
- planning, scheduling and coordinating the design task
- applying design process and scientific principles to aircraft system design proposals, including modifications
- solving problems and making decisions, with systems thinking, for contingencies and constraints, including airworthiness regulatory requirements and continuous improvement (may be requirements of CM and ILS)
- defining designs, specifying, documenting and applying graphical techniques, modelling, mock-up or prototyping techniques
- selecting system components to meet design specifications and standards
- creating and maintaining adequate and accurate calculations and design process records
- reporting and documenting results of investigations, application of principles and techniques, calculations, specifications, diagrams, computer-aided design (CAD) files, mock-ups or prototypes of designs
- complying with regulatory procedures for design and modification approval.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- life-cycle design and sustainability implications of aircraft system designs
- design processes and techniques to investigate, synthesise and develop proposals, evaluate feasibility against design criteria, review and revise in consultation with stakeholders, model, mock-up and prototype

- systems approach, problem solving and decision making, and continuous improvement methods
- application of CM and ILS procedures
- WHS and regulatory requirements, codes of practice, standards, risk management and registration requirements
- professional and technical assistance for engineering specialisations
- procedures for planning, scheduling and coordination of design
- component and hardware requirements of typical aircraft systems
- engineering scientific principles required for design analysis
- design calculations techniques
- software for product planning and design, such as CAD, systems design and project management
- required documentation, such as:
 - design brief and records of negotiation
 - planning and schedule
 - calculations and diagrams documentation for checking and design records
 - specifications and graphics required to define designs
 - risk analysis report
 - design process summary report
 - life cycle and sustainability reports
 - CM and ILS documentation
 - documentation required by Regulators for approval of designs and modifications
- prototyping options, including mock-ups, physical and virtual modelling, rapid prototyping.

Assessment Conditions

- 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 a simulated working environment 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.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - communicate, negotiate and review design brief with stakeholders

- determine or confirm scientific principles and design techniques, WHS and regulatory requirements, and design specification requirements
- evaluate multiple solutions
- apply CM and ILS requirements
- investigate life-cycle design and sustainability, technical and professional assistance required
- plan, schedule and coordinate the design task
- select design components using design process and scientific principles
- solve problems and make decisions with systems thinking for contingencies and constraints and continuous improvement
- define designs, specify and document and apply graphical techniques, modelling, mock-up or prototyping techniques
- create and maintain adequate and accurate calculations and design process records
- report and document, results and processes
- follow regulatory requirements and procedures for design, modification or repair procedures.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA711 Apply avionic analogue design techniques

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to design of avionic analogue systems and components for aircraft, design of modifications, test stations and development and update of test procedures and of repair requirements. It includes electrical, electronic and software design techniques and performance of the design process within the requirements of airworthiness regulators and documentation of the design process within management systems, such as Configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working as members of avionic system design teams and for those employed within maintenance engineering support departments or pursuing careers and qualifications as paraprofessionals in avionic engineering.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA702	Produce avionic engineering related graphics
MEA708	Select and test avionic engineering materials
MEA714	Integrate avionic fundamentals into an engineering task
MEA725	Apply advanced scientific principles and techniques in avionic engineering situations

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|--|
| 1. Investigate requirements of avionic analogue design projects | 1.1. Review the context and negotiate parameters of the engineering design brief in consultation with stakeholders |
| | 1.2. Determine engineering scientific principles and design techniques required for design process |
| | 1.3. Investigate life-cycle design and sustainability implications of avionic design |
| | 1.4. Determine specification, documentation and graphical techniques required to define designs |
| | 1.5. Confirm work health and safety (WHS), regulatory requirements, codes of practice, standards, risk management and registration requirements relevant to avionic design project |
| | 1.6. Investigate the need for technical and professional assistance |
| 2. Apply avionic analogue design techniques | 2.1. Plan, schedule and coordinate the design task |
| | 2.2. Apply the design process and avionic scientific principles to component selection and design proposals |
| | 2.3. Create adequate and accurate calculations, preliminary graphics and maintain design process records |
| | 2.4. Evaluate multiple solutions against design criteria, risk, sustainability and cost |
| | 2.5. Integrate avionic analogue techniques, hardware and software, including mechanical, fluid, electrical, electronic, controller and networking |
| | 2.6. Apply systems thinking, problem solving and decision making in dealing with contingencies and constraints for continuous improvement and development of design options |

- | | | |
|----|----------------|--|
| | 2.7 | Incorporate professional and technical assistance as required |
| | 2.8 | Apply specification, documentation and graphical techniques modelling, mock-up or prototyping techniques to define designs |
| 3. | Report results | 3.1 Report results of investigations, application and development of avionic design |
| | | 3.2 Provide documentation and records generated in the design process |
| | | 3.3 Provide draft documentation required by CM plan and/or ILS process, where applicable |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Avionic engineering refers to:

- The engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace electrical, instrument, radio and electronic systems and components and related test equipment for civil and military applications

Avionic analogue systems include:

- Flight and measuring instruments
- Communications
- Navigation
- Autopilot
- Interface with electrical power generation, control and distribution systems
- Interface with avionic digital systems

Context of engineering design activity includes:

- Competitive market
- Geo political factors, such as access to materials and markets

- Technological advantage/ disadvantage
 - Resources supply: materials, labour and skills
 - Sustainability issues relevant to design task, including:
 - social, economic and environmental considerations
 - material and energy resources
 - WHS, risk, and applicable standards and code requirements
- Planning processes include:**
- Establishing design parameters and design criteria
 - Contributing to the negotiation and advice process
 - Preliminary planning, design investigations and costing
 - Identifying design, development, prototyping activities and skills requirements
 - Planning and scheduling design activities
 - Improving, adjusting, rescheduling as required by emergency contingencies and constraints
- Design process includes:**
- Establishing design parameters and criteria
 - Researching, measuring, experimenting and investigating
 - Generating ideas
 - Synthesis, problem solving, decision making and addressing constraints
 - Applying scientific principles, calculation and graphics, prototyping and mock-up techniques
 - Evaluating solutions against design criteria
 - Consultation, adjustments and agreement
 - Finalising design and sign-off
- Design criteria includes:**
- Function
 - Aesthetics
 - Manufacturability and maintainability
 - Marketability
 - Sustainability:
 - social, economic and environmental
 - material and energy resources
 - Cost constraints
 - Ergonomics and anthropometrics and physiology
 - Facilities, plant and skills available
 - Safety and risk
- Design analysis includes:**
- Graphical and mathematical methods and software options associated with mechanical, electrical and electronic aspects of avionic analogue systems.
- Sustainability considerations include:**
- Resources and energy required for design:
 - Life-cycle design of product (manufacture to remanufacture or recycle)

- Environmental considerations in manufacturing and operation of design:
 - raw material, solids and hazardous waste, production by-products
 - potential contamination of land, air and storm water pollutants, discharge to sewerage
 - carbon pollution and reduction effects
- Configuration management (CM)**
 - CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life.
- Integrated logistic support (ILS)**
 - ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface
- Prototyping includes:**
 - Any combination of:
 - mock-ups
 - physical and virtual modelling with post-processing for computer-numerically controlled (CNC) and rapid prototyping
- Appropriate technical and professional assistance includes:**
 - Assistance from individuals with CASA maintenance certification licences or those with supervisory authorisations in the ADF regulatory system
 - Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
 - Engineers employed within organisations recognised by overseas airworthiness organisations
- WHS, regulatory**
 - WHS Acts and regulations

requirements and enterprise procedures include:

- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- State and territory regulatory requirements applying to electrical work
- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Relevant standards include:

- AS 1100.101-1992 Technical drawing – General principles
- AS 1102.101-1989 Graphical symbols for electrotechnical documentation - General information and general index
- AS/NZS ISO 31000 Set:2013 Risk Management Set
- NOHSC:1014 National standard for the control of major hazard facilities
- AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set
- ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework
- AS 61508.1-2011 Functional safety of electrical/ electronic/ programmable electronic safety related systems – General requirements
- AS 62061-2006 Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems
- IEEE 802 Wireless PAN, LAN, MAN and WPAN standards
- IEEE 1332, IEEE Standard reliability program for the development of electronic systems and equipment
- MIL-STD 785 Reliability program for systems and equipment development and production
- MIL-STD 1388-1A Logistic Support Analysis (LSA)
- MIL-STD 1388-2B Requirements for a LSA record
- MIL-STD 1629A Procedures for performing a failure mode, effects and criticality analysis (FMECA)
- MIL-STD 1629B FMECA
- MIL-STD 2173 Reliability centred maintenance requirements (superseded by NAVAIR 00-25-403)

Relevant handbooks include:

- OPNAVINST 4130.2A
- Integrated Logistic Support Handbook, third edition – James V Jones
- MIL-HDBK-217 Reliability prediction of electronic equipment
- MIL-HDBK-338B Electronic reliability design handbook
- MIL-HDBK-781A Reliability test methods, plans and environments for engineering development, qualification and production
- NASA PRA Probabilistic risk assessment handbook
- NASA Fault tree assessment handbook

Systems thinking includes:

- The process of developing solutions within the context of an entire system
- Recognising that an improvement in one subsystem can adversely affect another subsystem

Unit Mapping Information

Release 1 – new unit based on MEM14066A Plan and design avionic engineering projects – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA711 Apply avionic analogue design techniques

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- communicating, negotiating and reviewing context and parameters of the engineering design brief with stakeholders
- determining or confirming scientific principles and design techniques, WHS and regulatory requirements, and design specification requirements
- evaluating multiple solutions against design criteria, risk, sustainability and cost
- investigating life-cycle design and sustainability, technical and professional assistance required
- investigating CM and/or ILS requirements
- planning, scheduling and coordinating the avionic analogue design task
- applying design process and scientific principles to component selection and design proposals for components and avionic analogue systems
- solving problems and make decisions with systems thinking for contingencies and constraints and continuous improvement
- integrating avionic analogue techniques, hardware, components and software into aircraft electrical, instrument and electronic systems
- defining designs
- specifying, documenting and applying graphical techniques, modelling, mock-up or prototyping techniques
- creating and maintaining adequate and accurate calculations and design process records
- reporting and documenting results of investigations, application of principles and techniques, calculations, specifications, diagrams, computer-aided design (CAD) files, mock-ups or prototypes of designs.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- life-cycle design and sustainability implications of avionic component and system designs
- CM and ILS requirements

- design processes and techniques to investigate, synthesise and develop proposals, evaluate feasibility against design criteria, review and revise in consultation with stakeholders, model, mock-up and prototype
- systems thinking, problem solving, decision making and continuous improvement methods
- WHS and regulatory requirements, codes of practice, standards, risk management and registration requirements
- professional and licensed technical assistance for engineering specialisations
- requirement for consultation and negotiation to establish design parameters and criteria
- procedures for planning, scheduling and coordination of design
- hardware requirements of typical avionic analogue component and system applications
- engineering avionic scientific principles and techniques required for analogue system design tasks
- design calculations techniques
- software for product planning and design, such as CAD layout, circuit design, system software and project management
- required documentation:
 - design brief and records of negotiation
 - planning and schedule
 - calculations and diagrams documentation for checking and design records
 - specifications and graphics required to define designs
 - risk analysis report
 - design process summary report
 - life-cycle and sustainability reports
 - CM and ILS documentation
- prototyping options, including mock-ups, simulation, physical and virtual modelling, and rapid prototyping.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.

- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - communicate, negotiate and review design brief with stakeholders
 - determine or confirm scientific principles and design techniques, WHS and regulatory requirements, and design specification requirements
 - evaluate multiple solutions
 - investigate life-cycle design and sustainability, technical and professional assistance required
 - plan, schedule and coordinate the design task
 - select design components using design process and scientific principles
 - integrate avionic analogue techniques, hardware and software
 - solve problems and make decisions with systems thinking for contingencies and constraints and continuous improvement
 - define designs, specify, document and apply graphical techniques, modelling, mock-up or prototyping techniques
 - create and maintain adequate and accurate calculations and design process records
 - report and document, results and processes.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA712 Apply avionic digital design techniques

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to design of avionic digital systems and components for aircraft, including hardware and embedded system software, design of modifications, automatic test stations, and development and update of test procedures and of repair requirements. It includes electrical, electronic and software design techniques and performance of the design process within the requirements of airworthiness regulators and documentation of the design process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working as members of avionic system design teams and for those employed within maintenance engineering support departments or pursuing careers and qualifications as paraprofessionals in avionic engineering.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA702	Produce avionic engineering related graphics
MEA708	Select and test avionic engineering materials
MEA714	Integrate avionic fundamentals into an engineering task
MEA725	Apply advanced scientific principles and techniques in avionic engineering situations

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|---|
| 1. | Investigate requirements of avionic digital design projects | 1.1 | Review the context and negotiate parameters of the engineering design brief in consultation with stakeholders |
| | | 1.2 | Determine engineering scientific principles and design techniques required for design process |
| | | 1.3 | Investigate life-cycle design and sustainability implications of avionic digital design |
| | | 1.4 | Determine specification, documentation and graphical techniques required to define designs |
| | | 1.5 | Confirm work health and safety (WHS), regulatory requirements, codes of practice, standards, risk management and registration requirements relevant to avionic digital design project |
| | | 1.6 | Investigate the need for technical and professional assistance |
| 2. | Apply avionic digital design techniques | 2.1 | Plan, schedule and coordinate the design task |
| | | 2.2 | Apply the design process and avionic scientific principles to component selection and design proposals |
| | | 2.3 | Create adequate and accurate calculations, preliminary graphics and maintain design process records |
| | | 2.4 | Evaluate multiple solutions against design criteria, risk, sustainability and cost |
| | | 2.5 | Integrate avionic techniques, hardware and embedded software, including mechanical, fluid, electrical, electronic, controller and networking |
| | | 2.6 | Apply systems thinking, problem solving and decision making in dealing with contingencies and constraints for continuous improvement and |

- development of design options
- 2.7 Incorporate professional and technical assistance as required
 - 2.8 Apply specification, documentation and graphical techniques modelling, mock-up or prototyping techniques to define designs
3. Report results
- 3.1 Report results of investigations, application and development of avionic digital design
 - 3.2 Provide documentation, such as calculations, specifications, diagrams, computer-aided design (CAD) files, control circuits and controller programs, mock-ups or prototypes
 - 3.3 Provide draft documentation required by CM plan and/or ILS process, where applicable

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Avionic engineering refers to:

- The engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace electrical, instrument, radio and electronic systems and components and related test equipment for civil and military applications

Avionic digital systems include:

- Instrument display systems
- Automatic flight and engine control systems
- Monitoring systems
- Navigation and communication systems, including integration through flight management systems
- In-flight entertainment systems
- On-board maintenance systems

Context of engineering design activity includes:

- Competitive market
- Geo political factors, such as access to materials and markets
- Technological advantage/disadvantage
- Resources supply: materials, labour and skills
- Sustainability issues relevant to design task, including:
 - social, economic and environmental considerations
 - material and energy resources
- WHS, risk, applicable standards and code requirements

Planning processes include:

- Establishing design parameters and design criteria
- Contributing to the negotiation and advice process
- Preliminary planning, design investigations and costing
- Identifying design, development, prototyping activities and skills requirements
- Planning and scheduling design activities
- Improving, adjusting, rescheduling as required by emergency contingencies and constraints

Design process includes:

- Establishing design parameters and criteria
- Researching, measuring, experimenting and investigating
- Generating ideas
- Synthesis, problem solving, decision making and addressing constraints
- Applying scientific principles, calculation and graphics, prototyping and mock-up techniques
- Evaluating solutions against design criteria
- Consultation, adjustments and agreement
- Finalising design and sign-off

Design criteria includes:

- Performance specifications
- Function
- Aesthetics
- Manufacturability and maintainability
- Marketability
- Sustainability:
 - social, economic and environmental
 - material and energy resources
- Cost constraints
- Ergonomics and anthropometrics and physiology
- Facilities, plant and skills available
- Safety and risk

Design analysis includes:

- Graphical and mathematical methods and software options associated with mechanical, electrical and

- electronic aspects of avionic digital systems
- Sustainability considerations include:**
- Resources and energy required for design:
 - Life-cycle design of product (manufacture to remanufacture or recycle)
 - Environmental considerations in manufacturing and operation of design:
 - raw material, solids and hazardous waste, and production by-products
 - potential contamination of land, air and stormwater pollutants, and discharge to sewerage
 - carbon pollution and reduction effects
- Configuration management (CM)**
- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life
- Integrated logistic support (ILS)**
- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface
- Prototyping includes:**
- Any combination of:
 - mock-ups
 - physical and virtual modelling with post-processing for computer-numerically controlled (CNC) and rapid prototyping
- Appropriate technical and professional assistance includes:**
- Assistance from individuals with CASA maintenance certification licences or those with supervisory authorisations in the ADF regulatory system
 - Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF

regulatory system

WHS, regulatory requirements and enterprise procedures include:

- Engineers employed within organisations recognised by overseas airworthiness organisations
- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- State and territory regulatory requirements applying to electrical work
- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Relevant standards include:

- AS 1100.101-1992 Technical drawing – General principles
- AS 1102.101-1989 Graphical symbols for electrotechnical documentation - General information and general index
- AS/NZS ISO 31000 Set:2013 Risk Management Set
- NOHSC:1014 National standard for the control of major hazard facilities
- AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set
- ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework.
- AS 61508.1-2011 Functional safety of electrical/ electronic/ programmable electronic safety related systems – General requirements
- AS 62061-2006 Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems
- IEEE 802 Wireless PAN, LAN, MAN and WPAN standards
- IEEE 1332, IEEE Standard reliability program for the development of electronic systems and equipment
- MIL-STD 785 Reliability program for systems and equipment development and production
- MIL-STD 1388-1A Logistic Support Analysis (LSA)
- MIL-STD 1388-2B Requirements for a LSA record
- MIL-STD 1629A Procedures for performing a failure

mode, effects and criticality analysis (FMECA)

- MIL-STD 1629B FMECA
 - MIL-STD 2173 Reliability centred maintenance requirements (superseded by NAVAIR 00-25-403)
 - OPNAVINST 4130.2A
- Relevant handbooks include:**
- Integrated Logistic Support Handbook, third edition – James V Jones
 - MIL-HDBK-217 Reliability prediction of electronic equipment
 - MIL-HDBK-338B Electronic reliability design handbook
 - MIL-HDBK-781A Reliability test methods, plans and environments for engineering development, qualification and production
 - NASA PRA Probabilistic risk assessment handbook
 - NASA Fault tree assessment handbook
- Systems thinking includes:**
- The process of developing solutions within the context of an entire system
 - Recognising that an improvement in one subsystem can adversely affect another subsystem

Unit Mapping Information

Release 1 – new unit based on MEM14066A Plan and design avionic engineering projects – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA712 Apply avionic digital design techniques

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- communicating, negotiating and reviewing context and parameters of the engineering design brief with stakeholders
- determining or confirming scientific principles and design techniques, WHS and regulatory requirements, and design specification requirements
- evaluating multiple solutions against design criteria, risk, sustainability and cost
- investigating life-cycle design and sustainability, technical and professional assistance required
- investigating CM and/or ILS requirements
- planning, scheduling and coordinating the avionic design task
- applying design process and scientific principles to component selection and design proposals for components and avionic digital systems
- solving problems and making decisions with systems thinking for contingencies and constraints and continuous improvement
- integrating avionic techniques, hardware, components and software into aircraft avionic digital systems
- defining designs
- specifying, documenting and applying graphical techniques, modelling, mock-up or prototyping techniques
- creating and maintaining adequate and accurate calculations and design process records
- reporting and documenting, results of investigations, application of principles and techniques, calculations, specifications, diagrams, CAD files, mock-ups or prototypes of designs.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- life-cycle design and sustainability implications of avionic digital component and system designs
- CM and ILS requirements

- design processes and techniques to investigate, synthesise and develop proposals, evaluate feasibility against design criteria, review and revise in consultation with stakeholders, model, mock-up and prototype
- systems thinking, problem solving, decision making and continuous improvement methods
- WHS and regulatory requirements, codes of practice, standards, risk management and registration requirements
- professional and licensed technical assistance for engineering specialisations
- requirement for consultation and negotiation to establish design parameters and criteria
- procedures for planning, scheduling and coordination of design
- hardware requirements of typical avionic digital component and system applications
- engineering avionic scientific principles and techniques required for digital system design tasks
- design calculations techniques
- software for product planning and design, such as CAD layout, circuit design, system software and project management
- required documentation:
 - design brief and records of negotiation
 - planning and schedule
 - calculations and diagrams documentation for checking and design records
 - specifications and graphics required to define designs
 - risk analysis report
 - design process summary report
 - life-cycle and sustainability reports
 - CM and ILS documentation
- prototyping options, including mock-ups, simulation, physical and virtual modelling, rapid prototyping.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.

- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - communicate, negotiate and review design brief with stakeholders
 - determine or confirm scientific principles and design techniques, WHS and regulatory requirements, design specification requirements
 - evaluate multiple solutions
 - investigate life-cycle design and sustainability, technical and professional assistance required
 - plan, schedule and coordinate the design task
 - select design components using design process and scientific principles
 - integrate avionic digital techniques, hardware and software
 - solve problems and make decisions with systems thinking for contingencies and constraints and continuous improvement
 - define designs, specify and document and apply graphical techniques, modelling, mock-up or prototyping techniques
 - create and maintain adequate and accurate calculations and design process records
 - report and document results and processes.
- Assessment may be in conjunction with assessment of other units of competency where required
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA713 Integrate aeronautical fundamentals into an engineering task

Modification History

Release 1 - New unit of competency

Application

The unit of competency applies to engineering or related projects requiring aeronautical engineering skills and includes the identification, application and integration of aeronautical fundamentals. It includes identifying task parameters, personal and team function, chain of responsibility and work health and safety (WHS) guidelines. It includes investigation of aircraft structure, power plants and of mechanical, hydraulic, pneumatic and flight control systems and components and aeronautical fundamentals, including structural, power plant and aircraft system methods and processes, workshop techniques, materials, scientific and mathematical principles and computer software. It requires completion of the task in cooperation with the team and documentation of the process and outcomes.

It is suitable for people pursuing paraprofessional careers and qualifications in aeronautical engineering.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA705	Apply basic scientific principles and techniques in aeronautical engineering situations
MEM23004A	Apply technical mathematics
MEM23007A	Apply calculus to engineering tasks

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Investigate scope of engineering task	1.1 Determine task parameters and context
	1.2 Confirm personal functions and responsibilities, team and support functional group interdependencies and communications
	1.3 Confirm that task and responsibility is appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available when required
	1.4 Determine chain of responsibility for the activity
	1.5 Determine WHS, regulatory requirements, risk management and organisational procedures
2. Evaluate task for aeronautical fundamentals requirements	2.1 Evaluate methods, processes and workshop techniques required by task
	2.2 Evaluate aeronautical fundamentals required by task
	2.3 Evaluate functions and features of aeronautical components and systems related to the task
	2.4 Evaluate software techniques required for basic programming, analysis and graphics
3. Integrate aeronautical fundamentals	3.1 Plan the task
	3.2 Communicate, cooperate and negotiate with stakeholders, use systems thinking to address contingencies and constraints, problem solving and decision making and continuous improvement to achieve integration task
	3.3 Integrate aeronautical fundamentals to achieve task objectives
4. Report results	4.1 Report results of investigation, evaluation and integration

- 4.2 Provide documentation, such as diagrams and calculations
- 4.3 Provide documentation, such as modification instructions and maintenance manual or manual amendment and other documentation required by configuration management (CM) or integrated logistic support (ILS) procedures, where applicable

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Appropriate technical and professional assistance includes:

- Specific licenses and authorisations required by the relevant airworthiness regulator, CASA or the ADF
- Technical support and advice relating to elements which have intrinsic dangers, for example:
 - high pressure
 - energised fluid vessels
 - high temperatures and heat energy capacity
 - wiring with high current control voltages above extra low voltage
- Professional support for technologies, such as:
 - specialist electric motor drives and controllers
 - specialist materials, plastics, metal alloys and nano materials
- Special processes, foundry, alloy welding, heat treatment, sealing and fastening

WHS, regulatory requirements and enterprise procedures include:

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices

- State and territory regulatory requirements applying to electrical work
 - Civil Aviation Safety Regulations (CASRs)
 - AAP7001.053 ADF Technical Airworthiness Management Manual
 - Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency
- Systems thinking includes:**
- The process of developing solutions within the context of an entire system
 - Recognising that an improvement in one subsystem can adversely affect another subsystem
- Continuous improvement implementation:**
- Continuous improvement implementation relates to plant, products, processes, systems or services, including design, development, implementation or manufacture, commissioning, operation or delivery and maintenance. Continuous improvement is part of CM and ILS.
 - Improvement processes include techniques, such as:
 - balanced scorecard
 - current and future state mapping
 - measuring performance against benchmarks
 - process improvement, problem solving and decision making
 - data management, generation, recording, analysing, storing, use of software
 - training for improvement systems participation
 - technical training
- Constraints and contingencies include:**
- Financial
 - Organisation procedural or culture
 - Physical constraints such as limits to resources, limits to site access or logistical limitations
 - Airworthiness regulatory requirements
- Configuration management (CM)**
- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life
- Integrated logistic support (ILS)**
- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning

- supply and support
- support and test equipment
- manpower and personnel
- training and training support
- technical data and publications
- computer resources support
- facilities
- packaging, handling, storage and transportation
- design interface

Unit Mapping Information

Release 1 – new unit based on MEM14083A Apply aeronautical fundamentals to support design and development of engineering projects and MEM23073A Select and apply aeronautical engineering methods, processes and construction techniques – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA713 Integrate aeronautical fundamentals into an engineering task

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- communicating, cooperating and negotiating with stakeholders to achieve integration task
- determining task parameters and context, chain of responsibility, WHS, regulatory requirements, risk management and organisational procedures
- confirming personal, team and support personnel tasks and responsibilities
- evaluating task requirements, principles, techniques, components and systems, including software requirements, and software for basic analysis and graphics
- planning the task
- integrating aeronautical fundamentals to achieve task objectives
- solving problems and making decisions using systems thinking and continuous improvement to address contingencies and constraints and application of CM and/or ILS procedures
- report and documenting results of investigation, evaluation and integration, diagrams and calculations.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS and organisational safe working procedures
- task parameters and broader context
- personal function and responsibilities
- chain of responsibility for the activity
- team interdependencies
- aeronautical fundamentals, including:
 - mathematics
 - materials properties (ferrous metals, non-ferrous metals and fibre composites)
 - mechanics
 - chemistry
 - light, sound and electromagnetic effects, including avoidance of electro-magnetic interference

- thermodynamics and heating, aircraft air conditioning and cabin pressurisation
- gas turbine and piston engines
- aviation fuels and fuel additives
- fluid mechanics
- fluid power
- hydraulic fluid characteristics
- electrical and electronic control interfaces
- fundamentals of system layout and function
- computing
- graphics, including computer-aided design and drafting (CAD) systems
- typical workshop processes
- methods and processes, including:
 - assembly of metal structure using bolts, screws, rivets and adhesives
 - assembly of composite structure using bolts, screws, rivets and adhesive bonding
 - repair techniques for metal and composite structure
 - fabrication of ducting and plumbing for hydraulic, fuel and pneumatic systems
 - fabrication of cables for mechanical linkages and systems
 - simple programming
 - simple interfacing and signal conditioning in relation to systems, such as flight controls and pressurisation/air conditioning
 - machining, such as turning, milling, broaching, boring, shaping, planning, drilling, reaming, sawing, grinding and threading
 - hot and cold working processes
 - press operations, such as drawing, punching, cropping and forging
 - fabrication and welding of metals and plastics
 - fabrication of composite structure components
 - powder metallurgy
 - heat treatment
 - moulding, casting and forging
 - assembly, sealing, fastening and gluing
 - jigs and fixtures
 - surface plating and coating
 - computer-aided engineering (CAE) processes, such as CAD/computer-aided manufacturing (CAM)/computer-numerically controlled (CNC)/rapid processes
- functions and features of aeronautical components and systems, such as:
 - mechanical systems, such as flight controls and system components
 - hydraulic power generation and systems, such as landing gear retraction, brakes, flaps/spoilers and powered flight controls and system components
 - pneumatic systems, such as bleed air, pressurisation, air cycle air conditioning, anti-ice, brakes, flaps and landing gear retraction and system components
 - fuel storage and distribution systems and components

- power plants, including engines, engine systems, propellers, control systems and system components
- electrical systems and related wiring and components (power generation, distribution, circuit protection, control interfaces with hydraulic and pneumatic systems, and flap and landing gear retraction systems/components)
- electronic system interface relating to automatic flight control, full authority digital engine control, air conditioning and cabin pressurisation control systems
- system test stands and equipment, adapters and software
- integration of aeronautical fundamentals required for task
- communication requirements of task
- current options and trends in software, including system layout and simulation
- integration management methods.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - communicate, cooperate and negotiate with stakeholders to achieve integration task
 - determine task parameters and context, chain of responsibility, WHS, regulatory requirements, risk management and organisational procedures
 - confirm personal, team and support personnel tasks and responsibilities
 - evaluate task requirements, principles, techniques, typical applications and software
 - plan the task
 - integrate avionic fundamentals to achieve task objectives
 - solve problems and make decisions using systems thinking and continuous improvement to address contingencies and constraints
 - report and document results.
- Assessment may be in conjunction with assessment of other units of competency where required.

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A714 Integrate avionic fundamentals into an engineering task

Modification History

Release 1 - New unit of competency

Application

The unit of competency applies to engineering or related projects requiring avionic engineering skills and includes the identification, application and integration of avionic fundamentals. It includes identifying task parameters, personal and team function, chain of responsibility and work health and safety (WHS) guidelines. It includes investigation of aircraft electrical, instrument, radio and data systems and components and avionic fundamentals, including electrical and electronic methods and processes, workshop techniques, materials, scientific and mathematical principles and computer software. It requires completion of the task in cooperation with the team and documentation of the process and outcomes.

It is suitable for people pursuing paraprofessional careers and qualifications in avionic engineering.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A706 Apply basic scientific principles and techniques in avionic engineering

and

MEM23004A Apply technical mathematics

PLUS

MEM23007A Apply calculus to engineering tasks

or

ME A727 Apply calculus in avionic engineering situations

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Investigate scope of engineering task	1.1	Determine task parameters and context
	1.2	Confirm personal functions and responsibilities, team and support functional group interdependencies and communications
	1.3	Confirm that task and responsibility is appropriate to qualifications and delegations and that appropriate support including technical and professional assistance is available when required
	1.4	Determine chain of responsibility for the activity
	1.5	Determine WHS, regulatory requirements, risk management and organisational procedures
2. Evaluate task for avionic fundamentals requirements	2.1	Evaluate methods, processes and workshop techniques required by task
	2.2	Evaluate avionic fundamentals required by task
	2.3	Evaluate functions and features of avionic components and systems related to the task
	2.4	Evaluate software techniques required for basic programming, analysis and graphics
3. Integrate avionic fundamentals	3.1	Plan the task
	3.2	Communicate, cooperate and negotiate with stakeholders, use systems thinking to address contingencies and constraints, problem solving and decision making and continuous improvement to achieve integration task
	3.4	Integrate avionic fundamentals to achieve task objectives

- 4. Report results
 - 4.1 Report results of investigation, evaluation and integration
 - 4.2 Provide documentation, such as diagrams and calculations
 - 4.3 Provide documentation, such as modification instructions and maintenance manual or manual amendment and other documentation required by configuration management (CM) or integrated logistic support (ILS) procedures, where applicable

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

<p>This field allows for 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.</p>	
<p>Appropriate technical and professional assistance includes:</p>	<ul style="list-style-type: none"> • Assistance from holders of specific licenses and authorisations required by the relevant airworthiness regulator, CASA or the ADF • Technical support and advice relating to elements which have intrinsic dangers, for example: <ul style="list-style-type: none"> • high pressure • energised fluid vessels • high temperatures and heat energy capacity • wiring with high current control voltages above extra low voltage • Professional support for technologies, such as: <ul style="list-style-type: none"> • specialist electric motor drives and controllers • specialist materials, plastics, metal alloys and nano materials • Special processes, foundry, alloy welding, heat treatment, sealing and fastening
<p>WHS, regulatory requirements and enterprise</p>	<ul style="list-style-type: none"> • WHS Acts and regulations • Relevant standards

procedures include:	<ul style="list-style-type: none"> • Industry codes of practice • Risk assessments • Registration requirements • Safe work practices • State and territory regulatory requirements applying to electrical work • Civil Aviation Safety Regulations (CASRs) • AAP7001.053 ADF Technical Airworthiness Management Manual • Overseas airworthiness authorities where applicable e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency
Systems thinking includes:	<ul style="list-style-type: none"> • The process of developing solutions within the context of an entire system • Recognising that an improvement in one subsystem can adversely affect another subsystem
Continuous improvement implementation	<ul style="list-style-type: none"> • Continuous improvement implementation relates to plant, products, processes, systems or services including design, development, implementation or manufacture, commissioning, operation or delivery and maintenance. Continuous improvement is part of CM and ILS • Improvement processes, including: <ul style="list-style-type: none"> • balanced scorecard • current and future state mapping • measuring performance against benchmarks • process improvement, problem solving and decision making • data management, generation, recording, analysing, storing and using of software • training for improvement systems participation • technical training
Constraints and contingencies include:	<ul style="list-style-type: none"> • Financial • Organisation procedural or culture • Physical constraints, such as limits to resources, limits to site access or logistical limitations • Airworthiness regulatory requirements
Configuration management (CM)	<ul style="list-style-type: none"> • CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life
Integrated logistic support	<ul style="list-style-type: none"> • ILS is an integrated approach to the management of logistic disciplines originally developed for the

(ILS)	management of military systems from design concept to final disposal at life-of-type. It covers: <ul style="list-style-type: none">• reliability engineering, maintainability engineering and maintenance planning• supply and support• support and test equipment• manpower and personnel• training and training support• technical data and publications• computer resources support• facilities• packaging, handling, storage and transportation• design interface
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Unit Mapping Information

Release 1 – new unit based on MEM14084A Apply avionic fundamentals to support design and development of engineering projects and MEM23074A Select and apply avionic engineering methods, processes and construction techniques – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA714 Integrate avionic fundamentals into an engineering task

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- communicating, cooperating and negotiating with stakeholders to achieve integration task
- determining task parameters and context, chain of responsibility, WHS, regulatory requirements, risk management and organisational procedures
- confirming personal, team and support personnel tasks and responsibilities
- evaluating task requirements, principles, techniques, avionic components and systems, including software requirements, and software for basic analysis and graphics
- planning the task
- integrating avionic fundamentals to achieve task objectives
- solve problems and making decisions using systems thinking and continuous improvement to address contingencies and constraints and application of CM and/or ILS procedures
- reporting and documenting results of investigation, evaluation and integration, diagrams and calculations.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- WHS and organisational safe working procedures
- task parameters and broader context
- personal function and responsibilities
- chain of responsibility for the activity
- team interdependencies
- avionic fundamentals, including:
 - mathematics
 - materials properties
 - mechanics
 - chemistry
 - light, sound and electromagnetic effects, including avoidance of electro-magnetic interference

- thermodynamics and heating, aircraft air conditioning and cabin pressurisation
- fluid mechanics
- fluid power
- electrical and electronic fundamentals
- fundamentals of system interfacing and signal conditioning
- computing
- graphics, including computer aided design and drafting (CAD) systems
- typical workshop processes
- methods and processes, including:
 - basic electrical and electronic control circuit assembly, including production of printed circuit boards
 - wiring and soldering, including high reliability hand soldering
 - simple programming
 - simple interfacing and signal conditioning
 - machining, such as turning, milling, broaching, boring, shaping, planing, drilling, reaming, sawing, grinding and threading
 - hot and cold working processes
 - press operations, such as drawing, punching, cropping and forging
 - fabrication and welding of metals and plastics
 - powder metallurgy
 - heat treatment
 - moulding, casting and forging
 - assembly, sealing, fastening and gluing
 - jigs and fixtures
 - surface plating and coating
 - computer-aided engineering (CAE) processes, such as CAD/computer-aided manufacturing (CAM)/computer-numerically controlled (CNC)/rapid processes
- functions and features of avionic components and systems, including:
 - electrical systems and related wiring and components (power generation, distribution, circuit protection, control interfaces with hydraulic and pneumatic systems, and caution and warning systems)
 - mechanical and electro-mechanical flight instruments (pitot/static, barometric and gyroscopic) and indication systems (quantity, pressure, temperature and position)
 - electronic systems and components (communications, radio navigation, pulse, display, automatic flight control, flight management and engine management)
 - air conditioning and cabin pressurisation control systems
 - automatic test stations, adapters and software
- integration of avionic fundamentals required for task
- communication requirements of task
- current options and trends in software, including circuit and system layout and simulation
- integration management methods.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - communicate, cooperate and negotiate with stakeholders to achieve integration task
 - determine task parameters and context, chain of responsibility, WHS, regulatory requirements, risk management and organisational procedures
 - confirm personal, team and support personnel tasks and responsibilities
 - evaluate task requirements, principles, techniques, typical applications and software
 - plan the task
 - integrate avionic fundamentals to achieve task objectives
 - solve problems and make decisions using systems thinking and continuous improvement to address contingencies and constraints
 - report and document results.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA715 Evaluate aeroplane flight control systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to mechanical and powered flight control systems and their components, including the interface of powered systems and automatic flight control systems. It involves evaluation of systems (mechanical and powered systems and their components and the interface with automatic flight control systems) within both civil and military environments for compliance with design and performance standards, and with airworthiness regulatory requirements.

Also covered is documentation of the evaluation process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations, and for those pursuing qualifications or careers in those fields.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA710	Apply aeronautical system design techniques
MEM23004A	Apply technical mathematics
MEM23007A	Apply calculus to engineering tasks

Competency Field

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Prepare to evaluate aeroplane flight control system applications | 1.1 | Confirm and apply safe working practices relating to aeroplane flight control systems |
| | | 1.2 | Determine parameters and context of applications and purpose of evaluation |
| | | 1.3 | Confirm personal functions and responsibilities, team and support functional group interdependencies and communications |
| | | 1.4 | Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available |
| | | 1.5 | Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines |
| | | 1.6 | Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice, performance requirements and standards, including airworthiness regulatory requirements for aeroplane flight control systems, risk management and organisational procedures |
| 2. | Identify principles and techniques required for evaluation of aeroplane flight control system applications | 2.1 | Identify features and functions of aeroplane flight control systems and components |
| | | 2.2 | Review aeroplane flight control system design and layout requirements and techniques |
| | | 2.3 | Identify system electrical power requirements and interfaces with avionic systems |
| 3. | Evaluate aeroplane flight control system applications | 3.1 | Evaluate proposed modifications to aeroplane flight control systems and system components |
| | | 3.2 | Evaluate aeroplane flight control system and system component maintenance requirements |

- 3.3 Evaluate aeroplane flight control system and system component reliability and defect history
- 3.4 Evaluate proposed component substitutions
- 3.5 Evaluate application for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management
- 4. Report results
 - 4.1 Report results of scoping, principles and techniques identification and evaluation of applications
 - 4.2 Provide documentation, such as system schematics, wiring diagrams and data required by CM and/or ILS and as required by airworthiness regulations

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aeroplane flight control systems include:

- Mechanical primary flight control
- Powered primary flight control
- Trim
- Flaps
- High lift and spoiler
- Speed brakes
- Interfaces with automatic flight control systems and with electrical and instrument systems

Aeroplane flight control system components include:

- Cockpit controls
- Cable runs and hardware
- Mechanical linkages
- Hydraulic actuators and boost packs
- Hydraulic plumbing, valves and filters
- Trim mechanical and electrical actuators

Standards and guidance material include:

- Flap mechanical, hydraulic and electrical actuators
- Flap tracks and rollers
- High lift and spoiler actuators and mechanical linkages
- Speed brake actuators
- Indicators, lights and switches
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- CASA AC21.16(0) Approval of material, parts, processes and appliances
- CASA AC21.145(0) Manufacture of parts during the course of maintenance
- CASA AC21.601(0) Australian Technical Standards Order Authorisation
- CASA CAAP35-7(0) Design approval of modifications and repairs
- CASA AC 21-99 Aircraft Wiring and Bonding
- FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair

Configuration management (CM)

- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life

Integrated logistic support (ILS)

- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support

- facilities
- packaging, handling, storage and transportation
- design interface

Appropriate technical and professional assistance

- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
- Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
- Engineers employed within organisations recognised by overseas airworthiness organisations

WHS, regulatory requirements and enterprise procedures include:

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Unit Mapping Information

Release 1 – new unit based on MEM23097A Apply automated systems principles and techniques in aeronautical engineering situations – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA715 Evaluate aeroplane flight control systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying WHS, regulatory and electrical safety requirements, risk management procedures, features and functions of aeroplane flight control systems and components, system design principles and techniques, including:
 - performance and operating environment
 - system control
 - indicating and circuit protection requirements
 - interface requirements between aeroplane flight control systems and other systems, including automatic flight control systems and electrical power distribution
- determining and confirming:
 - parameters and context of tasks
 - chain of responsibility
 - personal functions and responsibilities
 - team and support functional group interdependencies and communications
 - appropriate qualifications and delegations
 - appropriate support, including technical and professional assistance
- investigating associated CM and ILS requirements and drafting required data
- drafting material required for compliance with airworthiness regulations
- assessing and applying:
 - basic aeroplane flight control system performance analysis and design procedures
 - design standards, regulatory requirements
 - graphics skills and techniques
- evaluating system components and specifications against system design and operating criteria
- reporting and documenting results of scoping, principles and techniques identification and evaluation of applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- features and layout of aeroplane flight control systems including control, indication and interface with other systems:
 - primary flight control mechanical systems and components
 - primary flight control powered systems - hydraulic actuators and boost packages
 - interface with automatic flight control synchros and servos
 - trim systems – mechanical and electrical
 - flaps – mechanical, hydraulic and electrical actuation
 - high lift and spoiler systems
 - speed brakes
- basic design principles for:
 - primary flight controls (aerodynamics, stability, control surface mass and aerodynamic balancing, flutter)
 - primary flight control mechanical systems and components
 - powered flight control systems and components
 - trim systems and components
 - flap systems including actuators and mechanical linkages
 - high lift and spoiler systems including actuators and mechanical linkages
 - speed brakes and system components
- interface with the aircraft electrical and instrument systems
- interface with automatic flight control systems
- wiring types, standards and specifications
- performance and operating environment effects
- airworthiness regulator design standards
- compliance requirements of the WHS Act and regulations, codes of practice, standards, risk assessment
- scope of trade, technical and professional support services required in aircraft flight control system applications
- management data interface with CM and ILS.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.

- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and apply WHS, regulatory and risk management procedures
 - determine parameters and context of tasks, personal, team, licensed technical and professional assistance and support personnel functions and responsibilities, and chain of responsibility
 - investigate sustainability implications of aeroplane flight control system applications as specified in CM and/or ILS requirements
 - assess and apply basic aeroplane flight control system design and maintenance/repair requirements, and graphics skills and techniques
 - evaluate aeroplane flight control systems and components for compliance with WHS and airworthiness regulatory requirements
- report and document results including provision of CM and ILS input data
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA716 Evaluate avionic analogue systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to avionic analogue communication, navigation, instrument and automatic pilot systems. It involves evaluation of systems in accordance with standards and regulatory requirements within both civil and military environments for compliance with design and performance standards and with airworthiness regulatory requirements.

Also covered is documentation of the evaluation process within management systems such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations (AEOs), and for those pursuing paraprofessional qualifications or careers in those fields.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA711 Apply avionic analogue design techniques

MEA727 Apply calculus in avionic engineering situations

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Prepare to evaluate avionic analogue system	<p>1.1 Confirm and apply safe electrical working practice</p> <p>1.2 Review the effects of electricity on humans and identify dangerous high currents and voltages and regulatory requirements related to extra low, low and high voltage applications and relate these to aircraft radio frequency system operation and maintenance</p> <p>1.3 Determine parameters and context of applications and purpose of evaluation</p> <p>1.4 Confirm personal functions and responsibilities, team and support functional group interdependencies and communications</p> <p>1.5 Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available</p> <p>1.6 Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines</p> <p>1.7 Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice, performance requirements and standards, including airworthiness regulatory requirements for avionic systems, risk management and organisational procedures</p>
2. Identify principles and techniques required for evaluation of avionic analogue system and system components	<p>2.1 Identify features and functions of avionic analogue systems and components</p> <p>2.2 Review avionic analogue system design and layout requirements and techniques</p> <p>2.3 Identify system power requirements</p> <p>2.4 Identify electro-magnetic interference protection requirements</p>
3. Evaluate avionic	<p>3.1 Evaluate proposed modifications to avionic analogue</p>

analogue system and system components		systems and components
	3.2	Evaluate avionic analogue system and system component maintenance requirements
	3.3	Evaluate avionic analogue system and system component reliability and defect history
	3.4	Evaluate proposed component and piece part substitution
	3.5	Evaluate application for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management
4. Report results	4.1	Report results of scoping, principles and techniques identification and evaluation of applications
	4.2	Provide documentation, such as system schematics, wiring diagrams and data required by CM and/or ILS, and for compliance with airworthiness regulations

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Avionic analogue systems include:

- High frequency (HF) communications
- Very high frequency (VHF) communications
- Ultra-high frequency (UHF) communications
- Satellite communications
- Internal communications and public address
- Automatic direction finder
- VHF omni-directional range (VOR)
- Pulse:
 - weather radar

- radar altimeter
- air traffic control (ATC) transponder
- doppler navigation
- distance measuring equipment (DME)
- Automatic pilot
- Tactical aerial navigation (TACAN)
- Aircraft communication addressing and reporting (ACAR)
- Instrument landing system (ILS)
- Electro-mechanical flight and indicating instruments
- Compasses
- Interfaces with avionic digital systems, such as:
 - flight management
 - automatic flight control
 - electronic display, including flight instruments and centralised aircraft monitoring
 - area navigation (RNAV)

Avionic analogue system components include:

- Receivers
- Transmitters
- Transceivers
- Racks and cooling fans
- Tuners
- Indicators
- Antennas and related cables and hardware
- Analogue electronic circuitry and components
- Electro-mechanical flight instruments
- Electro-mechanical measuring instruments
- Pitot/static system components
- Wiring and related hardware
- Fuses and circuit breakers
- Synchros and servos
- Gyroscopes
- Sensors
- Flight instruments (air speed indicator, vertical speed indicator, altimeter, turn and slip, artificial horizon and directional gyro)
- Pitot/static components
- Compass indicators
- Flux valves
- Amplifiers
- Power supplies
- ADF AAP7001.054 Airworthiness Design

Standards and guidance

material include:

- Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- CASA AC 21-99 Aircraft Wiring and Bonding
- RTCA DO-160D Environmental Conditions and Test Procedures for Airborne Equipment
- Military Specification MIL-E-7016F: Electrical Load and Power Source Capacity, Aircraft, Analysis of
- SAE Aerospace AS50881 Wiring Aerospace Vehicles
- CASA AC21.16(0) Approval of material, parts, processes and appliances
- CASA AC21.145(0) Manufacture of parts during the course of maintenance
- CASA AC21.601(0) Australian Technical Standards Order Authorisation
- CASA CAAP35-7(0) Design approval of modifications and repairs
- FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair

Configuration management (CM)

- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life

Integrated logistic support (ILS)

- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation

Appropriate technical and professional assistance include:

- design interface
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
- Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
- Engineers employed within organisations recognised by overseas airworthiness organisations

WHS, regulatory requirements and enterprise procedures include:

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities where applicable e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Unit Mapping Information

Release 1 - new unit based on MEM23096A Apply avionic system design principles and techniques in avionic engineering situations and MEM23096A Apply avionic system design principles and techniques in avionic engineering situations – units not equivalent

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA716 Evaluate avionic analogue systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying WHS, regulatory and electrical safety requirements, risk management procedures, features and functions of aircraft analogue avionic systems and components, system design principles and techniques, including performance and operating environment, system control, indicating and circuit protection requirements and interface requirements between analogue avionic systems and other systems, including the electrical power distribution and avionic digital systems and system components
- reviewing effects of electricity on humans, dangerous high currents and voltages and automated systems, regulatory requirements related to extra low, low and high voltage applications and relating these to aircraft analogue avionic system applications
- reviewing effects of electro-magnetic radiation on humans and relate them to aircraft radio frequency and pulse systems
- determining and confirming parameters and context of tasks, chain of responsibility, personal functions and responsibilities, team and support functional group interdependencies and communications, appropriate qualifications and delegations, and appropriate support, including licensed technical and professional assistance
- investigating associated CM and ILS requirements and drafting required data
- identifying and drafting documents required for compliance with airworthiness regulations
- assessing and applying basic aircraft analogue avionic system performance analysis and design procedures, design standards, regulatory requirements and graphics skills and techniques
- evaluating system components and specifications against system design and operating criteria
- reporting and documenting results of scoping, principles and techniques identification and evaluation of applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- features and layout of aircraft avionic analogue systems, including control, indication and antennas

- features and layout of electro-mechanical flight instruments and instrument systems, including pitot static and vacuum systems
- features and layout of electro-mechanical measuring systems, including fuel quantity/flow, fluid pressure and position indicating
- analogue electronics
- pulse systems
- compass principles and systems
- gyroscopic principles
- synchro and servo systems, including feedback loops
- basic design principles for:
 - electro-mechanical instrument systems and instrument panel layout
 - analogue communications and navigation systems
 - pulse systems
 - autopilot systems
 - instrument landing systems
 - compass systems
- interface with avionic digital systems, such as flight management, area navigation, display and cabin services
- interface with the aircraft electrical system
- wiring and antenna cabling types, standards and specifications
- performance and operating environment effects
- airworthiness regulator design standards
- compliance requirements of the WHS Act and regulations, codes of practice, standards and risk assessment
- scope of trade, technical and professional support services required in electrical system applications
- management data interface with CM and ILS.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.

- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and apply WHS, regulatory and risk management procedures
 - review dangers and effects of electricity and electro-magnetic radiation on humans
 - determine parameters and context of tasks, personal, team, technical and professional assistance and support personnel functions and responsibilities, and chain of responsibility
 - investigate sustainability implications of aircraft analogue avionic system applications as specified in CM and/or ILS requirements
 - assess and apply basic aircraft analogue avionic system design and maintenance/repair requirements, software basic analysis and graphics skills and techniques
 - evaluate aircraft analogue avionic systems and components for compliance with WHS and airworthiness regulatory requirements
 - report and document results, including provision of CM and ILS input data.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA717 Evaluate avionic digital systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to avionic digital communication, navigation, instrument display, on-board computer and automatic flight systems and software for these systems. It involves evaluation of systems for compliance with design and performance standards and with airworthiness regulatory requirements within both civil and military environments.

Also covered is documentation of the evaluation process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working as paraprofessionals within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations, and for those pursuing qualifications or careers in those fields.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA712 Apply avionic digital design techniques

MEA727 Apply calculus in avionic engineering situations

Competency Field

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Prepare to evaluate avionic digital system
 - 1.1 Confirm and apply safe electrical working practice
 - 1.2 Review the effects of electricity on humans and identify dangerous high currents and voltages and regulatory requirements related to extra low, low and high voltage applications and relate these to aircraft digital system operation and maintenance
 - 1.3 Determine parameters and context of applications and purpose of evaluation
 - 1.4 Confirm personal functions and responsibilities, team and support functional group interdependencies and communications
 - 1.5 Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available
 - 1.6 Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines
 - 1.7 Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice, performance requirements and standards, including airworthiness regulatory requirements for avionic systems, risk management and organisational procedures
2. Identify principles and techniques required for evaluation of avionic digital system and system components
 - 2.1 Identify features and functions of avionic digital systems and components
 - 2.2 Review avionic digital system design and layout requirements and techniques
 - 2.3 Identify system power requirements and interfaces with aircraft and avionic analogue systems
 - 2.4 Identify electro-magnetic interference protection requirements
3. Evaluate avionic digital system and system components
 - 3.1 Evaluate proposed modifications to avionic digital systems, system components and software
 - 3.2 Evaluate avionic digital system and system component maintenance requirements
 - 3.3 Evaluate avionic digital systems and system

- component reliability and defect history
- 3.4 Evaluate proposed component and piece part substitution
 - 3.5 Evaluate application for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management
4. Report results
 - 4.1 Report results of scoping, principles and techniques identification and evaluation of applications
 - 4.2 Provide documentation, such as system schematics, software, wiring diagrams and data required by CM and/or ILS, and for compliance with airworthiness regulations

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Avionic digital systems include:

- Digital communications, including high frequency (HF), very high frequency (VHF), ultra-high frequency (UHF) and satellite
- Aircraft communication addressing and reporting (ACAR) system
- Display, including primary flight, multi-function and engine indicating and crew alerting
- Head-up display
- Automatic flight control
- Full-authority digital engine control
- Flight management computer
- Area navigation (RNAV)
- Traffic alert and collision avoidance
- Enhanced ground position warning

Digital system components include:

- Global navigation
- Inertial navigation and inertial reference
- Integrated modular avionics
- Cabin systems
- On-board maintenance computers
- Interfaces with avionic analogue communication and navigation systems
- Receivers
- Transmitters
- Transceivers
- Racks and cooling fans
- Tuners
- Computers and micro-processors
- Displays (CRT or LCD)
- Antennas and related cables and hardware
- Digital electronic circuitry and components
- Data buses
- Pitot/static system components
- Wiring and related hardware
- Fuses and circuit breakers
- Synchros and servos
- Gyroscopes
- Sensors
- Power supplies

Standards and guidance material include:

- ADF AAP7001.054 Airworthiness Design Requirements Manual
- CASA AC 21-46(0) Airworthiness Approval of Avionic Equipment
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- CASA AC 21-99 Aircraft Wiring and Bonding
- RTCA DO-160D Environmental Conditions and Test Procedures for Airborne Equipment
- RTCA DO-178B (also EUROCAE ED-12B) Software Considerations in Airborne Systems and Equipment Certification

- IEEE/EIA 12207 Information technology – Software life cycle processes
 - Military Specification MIL-E-7016F: Electrical Load and Power Source Capacity, Aircraft, Analysis of
 - SAE Aerospace AS50881 Wiring Aerospace Vehicles
 - CASA AC21.16(0) Approval of material, parts, processes and appliances
 - CASA AC21.145(0) Manufacture of parts during the course of maintenance
 - CASA AC21.601(0) Australian Technical Standards Order Authorisation
 - CASA CAAP35-7(0) Design approval of modifications and repairs
 - FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair
 - The Avionics Handbook
 - FAA-H-8083-6 Advanced Avionics Handbook
- Configuration management (CM)**
- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life
- Integrated logistic support (ILS)**
- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface
- Appropriate technical and professional assistance includes:**
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
 - Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF

- regulatory system
- WHS, regulatory requirements and enterprise procedures include:**
- Engineers employed within organisations recognised by overseas airworthiness organisations
 - WHS Acts and regulations
 - Relevant standards
 - Industry codes of practice
 - Risk assessments
 - Registration requirements
 - Safe work practices
 - Civil Aviation Safety Regulations (CASRs)
 - AAP7001.053 ADF Technical Airworthiness Management Manual
 - Overseas airworthiness authorities where applicable e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Unit Mapping Information

Release 1 – new unit based on MEM23096A Apply avionic system design principles and techniques in avionic engineering situations, MEM23096A Apply avionic system design principles and techniques in avionic engineering situations and MEM23098A Apply automated system principles and techniques in avionic engineering situations – units not equivalent

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA717 Evaluate avionic digital systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying WHS, regulatory and electrical safety requirements, risk management procedures, features and functions of aircraft digital avionic systems and components, system design principles and techniques, including performance and operating environment, system control, indicating and circuit protection requirements and interface requirements between avionic systems and other systems, including the electrical power distribution
- reviewing effects of electricity on humans, dangerous high currents and voltages and automated systems, regulatory requirements related to extra low, low and high voltage applications and relating these to aircraft digital avionic system applications
- reviewing effects of electro-magnetic radiation on humans and relate them to aircraft radio frequency and pulse systems
- determining and confirming:
 - parameters and context of tasks
 - chain of responsibility
 - personal functions and responsibilities
 - team and support functional group interdependencies and communications
 - appropriate qualifications and delegations
 - appropriate support including technical and professional assistance
- investigating associated CM and ILS requirements and drafting required data
- identifying and drafting documentation required for compliance with airworthiness regulations
- assessing and applying:
 - basic aircraft digital avionic system performance analysis and design procedures
 - design standards
 - regulatory requirements
 - graphics skills and techniques
- evaluating system components and specifications against system design and operating criteria
- evaluating system software against system design and operating criteria

- reporting and documenting results of scoping, principles and techniques identification and evaluation of applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- features and layout of aircraft avionic digital systems, including control, indication and antennas
- features and layout of instrument display systems, including:
 - engine indication and crew alert
 - primary flight
 - multi-function
 - head-up display
- flight management computer system
- digital electronics, including A-D and D-A converters
- pulse systems
- inertial navigation and inertial reference systems
- gyroscopic principles
- synchro and servo systems, including feedback loops
- master caution and warning systems
- basic design principles for:
 - display systems and instrument panel layout including head-up display
 - digital communications and navigation systems
 - pulse systems
 - digital autopilot systems
 - automatic flight control
 - digital engine control
 - automatic landing systems
 - inertial navigation and inertial reference systems
 - flight management computer systems
 - area navigation systems
 - on-board maintenance computer systems
 - cabin services
- avionic software design procedures and requirements
- data buses, including multiplexing and demultiplexing
- interface with the aircraft electrical system
- wiring and antenna cabling types, standards and specifications
- performance and operating environment effects
- airworthiness regulator design standards

- compliance requirements of the WHS Act and regulations, codes of practice, standards, risk assessment
- scope of trade, technical and professional support services required in digital avionic system applications
- management data interface with CM and ILS.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and apply WHS, regulatory and risk management procedures
 - review dangers and effects of electricity and electro-magnetic radiation on humans
 - determine parameters and context of tasks, personal, team, technical and professional assistance and support, personnel functions and responsibilities, and chain of responsibility
 - investigate sustainability implications of aircraft digital avionic system applications as specified in CM and/or ILS requirements
 - assess and apply basic aircraft digital avionic system design and maintenance/repair requirements, software basic analysis and graphics skills and techniques
 - evaluate aircraft digital avionic systems and components for compliance with WHS and airworthiness regulatory requirements
 - report and document results including provision of CM and ILS input data.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA718 Evaluate rotorcraft flight control systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to rotorcraft mechanical and powered flight control systems and their components, including the interface of powered systems and automatic flight control systems. It involves evaluation of systems and components for compliance with design and performance standards and with airworthiness regulatory requirements within both civil and military environments.

Also covered is documentation of the evaluation process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations (AEOs), and for those pursuing qualifications or careers in those fields.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA710	Apply aeronautical system design techniques
MEM23004A	Apply technical mathematics
MEM23007A	Apply calculus to engineering tasks

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Prepare to evaluate rotorcraft flight control system	<p>1.1 Confirm and apply safe working practices relating to aircraft pneumatic systems</p> <p>1.2 Determine parameters and context of applications and purpose of evaluation</p> <p>1.3 Confirm personal functions and responsibilities, team and support functional group interdependencies and communications</p> <p>1.4 Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available</p> <p>1.5 Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines</p> <p>1.6 Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice, performance requirements and standards, including airworthiness regulatory requirements for rotorcraft flight control systems, risk management and organisational procedures</p>
2. Identify principles and techniques required for evaluation of rotorcraft flight control system applications	<p>2.1 Identify features and functions of rotorcraft flight control systems and components</p> <p>2.2 Review rotorcraft flight control system design and layout requirements and techniques</p> <p>2.3 Identify system electrical power requirements and interfaces with avionic systems</p>
3. Evaluate rotorcraft flight control system	<p>3.1 Evaluate proposed modifications to rotorcraft flight control systems and system components</p> <p>3.2 Evaluate rotorcraft flight control system and system component maintenance requirements</p> <p>3.3 Evaluate rotorcraft flight control system and system component reliability and defect history</p>

- 3.4 Evaluate proposed component substitutions
- 3.5 Evaluate application for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management
- 4. Report results
 - 4.1 Report results of scoping, principles and techniques identification and evaluation of applications
 - 4.2 Provide documentation, such as system schematics, wiring diagrams and data required by CM and/or ILS, and as required for compliance with airworthiness regulations

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Rotorcraft flight control systems include:

- Mechanical flight control (cyclic, collective and tail rotor)
- Powered flight control
- Trim
- Interfaces with engine fuel control unit or throttle/governor
- Interfaces with automatic flight control systems, electrical and instrument systems and engine power control

Rotorcraft flight control system components include:

- Cockpit controls
- Cable runs and hardware
- Mechanical linkages
- Hydraulic actuators and valves
- Electric actuators
- Hydraulic power supply, plumbing, valves and filters
- Trim actuators

Standards and guidance material include:

- Mixer box
- Rotor swashplate
- Tail rotor pitch change mechanism
- Indicators, lights and switches
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 27 Airworthiness Standards for Rotorcraft in the Normal Category
- FAR Part 29 Airworthiness Standards for Rotorcraft in the Transport Category
- EASA CS-27 Certification Specifications for Rotorcraft in the Normal Category
- EASA CS-29 Certification Specifications for Rotorcraft in the Transport Category
- CASA AC21.16(0) Approval of material, parts, processes and appliances
- CASA AC21.145(0) Manufacture of parts during the course of maintenance
- CASA AC21.601(0) Australian Technical Standards Order Authorisation
- CASA CAAP35-7(0) Design approval of modifications and repairs
- CASA AC 21-99 Aircraft Wiring and Bonding
- FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair

Configuration management (CM)

- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life

Integrated logistic support (ILS)

- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation

Appropriate technical and professional assistance includes:

- design interface
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
- Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
- Engineers employed within organisations recognised by overseas airworthiness organisations

WHS, regulatory requirements and enterprise procedures include:

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Unit Mapping Information

Release 1 – New unit based on MEM23097A Apply automated systems principles and techniques in aeronautical engineering situations – units not equivalent

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA718 Evaluate rotorcraft flight control systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying WHS, regulatory and electrical safety requirements, risk management procedures, features and functions of aircraft flight control systems and components, system design principles and techniques, including:
 - performance and operating environment
 - system control
 - indicating and circuit protection requirements
 - interface requirements between rotorcraft flight control systems and other systems, including automatic flight control systems and electrical power distribution
- determining and confirming:
 - parameters and context of tasks
 - chain of responsibility
 - personal functions and responsibilities
 - team and support functional group interdependencies and communications
 - appropriate qualifications and delegations
 - appropriate support, including technical and professional assistance
- investigating associated CM and ILS requirements and drafting required data
- identifying and drafting data required for compliance with airworthiness regulations
- assessing and applying:
 - basic rotorcraft flight control system performance analysis and design procedures
 - design standards
 - regulatory requirements
 - graphics skills and techniques
- evaluating system components and specifications against system design and operating criteria
- reporting and documenting results of scoping, principles and techniques identification and evaluation of applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- features and layout of rotorcraft flight control systems, including control, indication and interface with other systems:
 - cyclic and collective flight control mechanical systems and components
 - cyclic and collective flight control powered systems - hydraulic actuators and irreversible valves
 - tail rotor control
 - interface with automatic flight control servo actuating devices and trim systems
 - interface with electrical power supply, instrument systems and engine power control system
- basic design principles for:
 - cyclic, collective and tail rotor flight controls
 - cyclic, collective and tail rotor flight control mechanical systems and components
 - powered flight control systems and components
 - trim systems and components
- interface with the aircraft electrical and instrument systems
- interface with automatic flight control systems
- wiring types, standards and specifications
- performance and operating environment effects
- airworthiness regulator design standards
- compliance requirements of the WHS Act and regulations, codes of practice, standards and risk assessment
- scope of trade, technical and professional support services required in aircraft flight control system applications
- management data interface with CM and ILS.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.

- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and apply WHS, regulatory and risk management procedures
 - determine parameters and context of tasks, personal, team, technical and professional assistance and support, personnel functions and responsibilities, and chain of responsibility
 - investigate sustainability implications of rotorcraft flight control system applications as specified in CM and/or ILS requirements
 - assess and apply basic rotorcraft flight control system design and maintenance/repair requirements, and graphics skills and techniques
 - evaluate aircraft flight control systems and components for compliance with WHS and airworthiness regulatory requirements
 - report and document results including provision of CM and ILS input data.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA719 Evaluate aircraft electrical systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to aircraft alternating current (AC) and direct current (DC) electrical systems, including power generation, control and distribution circuits and lighting systems. It involves evaluation of systems for compliance with design and performance standards and with airworthiness regulatory requirements within both civil and military environments.

Also covered is documentation of the evaluation process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working as paraprofessionals within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations (AEOs), and for those pursuing qualifications or careers in those fields.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA726 Apply aircraft electrical system design techniques

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes. Performance criteria describe the performance needed to demonstrate achievement of the element.

1. Prepare to evaluate aircraft electrical system
 - 1.1 Confirm and apply safe electrical working practice
 - 1.2 Review the effects of electricity on humans and identify dangerous high currents and voltages and regulatory requirements related to extra low, low and high voltage applications and relate these to aircraft electrical system operation and maintenance
 - 1.3 Determine parameters and context of applications and purpose of evaluation
 - 1.4 Confirm personal functions and responsibilities, team and support functional group interdependencies and communications
 - 1.5 Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available
 - 1.6 Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines
 - 1.7 Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice, performance requirements and standards, including airworthiness regulatory requirements for aircraft electrical systems, risk management and organisational procedures
2. Identify principles and techniques required for evaluation of aircraft electrical system
 - 2.1 Identify features and functions of aircraft electrical AC and DC systems and components
 - 2.2 Review aircraft electrical system design and layout requirements and techniques
 - 2.3 Identify system power generation and control requirements
 - 2.4 Identify electrical distribution system circuit and protection requirements
 - 2.5 Identify interfaces with aircraft and avionic systems and their power requirements
 - 2.6 Identify internal and external aircraft lighting requirements
3. Evaluate aircraft
 - 3.1 Evaluate proposed modifications to aircraft electrical

electrical system and system components		systems and system components
	3.2	Evaluate aircraft electrical system and system component maintenance requirements
	3.3	Evaluate aircraft electrical system and system component reliability and defect history
	3.4	Evaluate proposed component substitutions
	3.5	Evaluate application for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management
4.	Report results	
	4.1	Report results of scoping, principles and techniques identification and evaluation of applications
	4.2	Provide documentation, such as system schematics, wiring diagrams and data required by CM and/or ILS, and as required for compliance with airworthiness regulations

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aircraft electrical systems include:

- AC power generation and control
- DC power generation and control
- Batteries
- Electrical power distribution circuits and circuit protection
- External lighting circuits
- Internal lighting circuits
- Electrical interfaces with aircraft systems, such as:
 - hydraulic
 - landing gear and brakes

- doors
- pneumatic
- air conditioning and pressurisation
- flight controls
- engine controls
- anti-ice and de-ice
- fire detection and extinguishing
- Electrical interfaces with avionic systems, such as:
 - caution and warning
 - instrumentation
 - communications
 - navigation
 - pulse
 - on-board computer systems (e.g. automatic flight and engine control, flight management and on-board maintenance)
 - in-flight entertainment

Electrical system components include:

- Alternators, generators, inverters and transformer/rectifiers
- Batteries and emergency batteries
- Regulators and indicators, such as voltage, current and frequency
- Switches
- Relays
- Wiring and related hardware
- Fuses and circuit breakers
- Rheostats
- Rotary and linear actuators
- Lighting, including strobe lights
- Indication and warning lights

Standards and guidance material include:

- ASTM F2639-07 Standard Practices for Design, Alteration and Certification of Airplane Electrical Wiring Systems
- ARINC Report 609 Design Guidance for Aircraft Electrical Power Systems
- CASA AC 21-38(0) Aircraft Electrical Load Analysis and Power Source Capacity
- CASA AC 21-99 Aircraft Wiring and Bonding
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories

- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- FAR Part 27 Airworthiness Standards for Rotorcraft in the Normal Category
- FAR Part 29 Airworthiness Standards for Rotorcraft in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- EASA CS-27 Certification Specifications for Rotorcraft in the Normal Category
- EASA CS-29 Certification Specifications for Rotorcraft in the Transport Category
- RTCA DO-160D Environmental Conditions and Test Procedures for Airborne Equipment
- Military Specification MIL-E-7016F: Electrical Load and Power Source Capacity, Aircraft, Analysis of
- SAE Aerospace AS50881 Wiring Aerospace Vehicles
- CASA AC21.16(0) Approval of material, parts, processes and appliances
- CASA AC21.145(0) Manufacture of parts during the course of maintenance
- CASA AC21.601(0) Australian Technical Standards Order Authorisation
- CASA CAAP35-7(0) Design approval of modifications and repairs
- FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair

Configuration management (CM)

- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life

Integrated logistic support (ILS)

- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support

- technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface
- Appropriate technical and professional assistance includes:**
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
 - Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
 - Engineers employed within organisations recognised by overseas airworthiness organisations
- WHS, regulatory requirements and enterprise procedures include:**
- WHS Acts and regulations
 - Relevant standards
 - Industry codes of practice
 - Risk assessments
 - Registration requirements
 - Safe work practices
 - Civil Aviation Safety Regulations (CASRs)
 - AAP7001.053 ADF Technical Airworthiness Management Manual
 - Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Unit Mapping Information

Release 1 – New unit based on MEM23096A Apply avionic system design principles and techniques in avionic engineering situations and MEM23096A Apply avionic system design principles and techniques in avionic engineering situations – units not equivalent

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA719 Evaluate aircraft electrical systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying WHS, regulatory and electrical safety requirements, risk management procedures, features and functions of aircraft electrical systems and components, and system design principles and techniques, including:
 - load analysis and operating environment
 - system control
 - indicating and circuit protection requirements
 - interface requirements between the distribution circuits and aircraft hydro-mechanical and avionic systems/system components
- reviewing effects of electricity on humans, dangerous high currents and voltages and automated systems, regulatory requirements related to extra low, low and high voltage applications and relating these to aircraft electrical applications
- determining and confirming:
 - parameters and context of tasks
 - chain of responsibility
 - personal functions and responsibilities
 - team and support functional group interdependencies and communications
 - appropriate qualifications and delegations
 - appropriate support, including technical and professional assistance
- investigating associated CM and ILS requirements and drafting required data
- identifying and drafting data required for compliance with airworthiness regulations
- assessing and applying:
 - basic aircraft electrical system load analysis and design procedures
 - design standards
 - regulatory requirements
 - graphics skills and techniques
- evaluating system components and specifications against system design and operating criteria
- reporting and documenting results of scoping, principles and techniques identification and evaluation of applications, system schematics and wiring diagrams.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- features of aircraft electrical AC and DC systems, control and distribution, circuit protection and lighting system
- interface with aircraft hydro-mechanical systems, such as hydraulic, pneumatic, environmental, anti-ice, flight control and engine control
- interface with avionic systems, such as instrumentation, communications, navigation, pulse, on-board computer systems and in-flight entertainment
- requirements and procedures for electrical system load analysis
- electrical system components and related specifications
- wiring types, standards and specifications, including optical fibre
- operating environment effects
- airworthiness regulator design standards
- compliance requirements of the WHS Act and regulations, codes of practice, standards, risk assessment
- scope of trade, technical and professional support services required in electrical system applications
- management data interface with CM and ILS.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and apply WHS, regulatory and risk management procedures
 - review dangers and effects of electricity on humans
 - determine parameters and context of tasks, personal, team, licensed technical and professional assistance, support personnel functions and responsibilities, and chain of responsibility

- investigate sustainability implications of aircraft electrical system applications as specified in CM and/or ILS requirements
- assess and apply basic aircraft electrical system design and maintenance/repair requirements, software basic analysis and graphics skills and techniques
- evaluate aircraft electrical systems and components for compliance with WHS and airworthiness regulatory requirements
- report and document results including provision of CM and ILS input data.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA720 Evaluate aircraft gas turbine engine power plants

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to aircraft gas turbine engines, engine control, lubrication, inlet anti-ice and propeller systems, and components thereof. It involves evaluation of power plants and components for compliance with design standards and with airworthiness regulatory requirements within both civil and military environments.

Also covered is documentation of the evaluation process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations (AEOs), and for those pursuing qualifications or careers in those fields.

Where the engine is installed in a rotorcraft the integration of engine and rotor control is covered in unit MEA718 Evaluate rotorcraft flight control system.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA710	Apply aeronautical system design techniques
MEM23004A	Apply technical mathematics
MEM23007A	Apply calculus to engineering tasks

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Prepare to evaluate gas turbine engine power plant | 1.1 | Confirm and apply safe working practices relating to aircraft structure |
| | | 1.2 | Determine parameters and context of applications and purpose of evaluation |
| | | 1.3 | Confirm personal functions and responsibilities, team and support functional group interdependencies and communications |
| | | 1.4 | Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including licensed technical and professional assistance, is available |
| | | 1.5 | Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines |
| | | 1.6 | Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice and standards, including airworthiness regulatory requirements for aircraft gas turbine engine power plants, risk management and organisational procedures |
| 2. | Identify principles and techniques required for evaluation of aircraft gas turbine engine power plant | 2.1 | Identify features and functions of power plant and related systems |
| | | 2.2 | Review gas turbine engine and engine system operation, layout and performance |
| | | 2.3 | Review engine control system design and function, including interface with full authority digital engine control systems |
| | | 2.4 | Review propeller and propeller control system design and function, including coordination of pitch with fuel flow and engine power |
| | | 2.5 | Review engine inlet anti-ice system design and function |

- | | | | | | | | | | | | | |
|-----|--|---|-----|--|-----|--|-----|---|-----|---|-----|--|
| | 2.6 | Review engine lubricating system design and function | | | | | | | | | | |
| 3. | Evaluate aircraft gas turbine engine power plant and components | <table border="0"> <tr> <td>3.1</td> <td>Evaluate proposed modifications and repairs to power plant systems and components</td> </tr> <tr> <td>3.2</td> <td>Evaluate power plant maintenance requirements</td> </tr> <tr> <td>3.3</td> <td>Evaluate power plant reliability and defect history</td> </tr> <tr> <td>3.4</td> <td>Evaluate proposed component substitutions</td> </tr> <tr> <td>3.5</td> <td>Evaluate for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management</td> </tr> </table> | 3.1 | Evaluate proposed modifications and repairs to power plant systems and components | 3.2 | Evaluate power plant maintenance requirements | 3.3 | Evaluate power plant reliability and defect history | 3.4 | Evaluate proposed component substitutions | 3.5 | Evaluate for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management |
| 3.1 | Evaluate proposed modifications and repairs to power plant systems and components | | | | | | | | | | | |
| 3.2 | Evaluate power plant maintenance requirements | | | | | | | | | | | |
| 3.3 | Evaluate power plant reliability and defect history | | | | | | | | | | | |
| 3.4 | Evaluate proposed component substitutions | | | | | | | | | | | |
| 3.5 | Evaluate for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management | | | | | | | | | | | |
| 4. | Report results | <table border="0"> <tr> <td>4.1</td> <td>Report results of scoping, principles and techniques identification and evaluation of gas turbine engine power plant systems and system components</td> </tr> <tr> <td>4.2</td> <td>Provide documentation, such as modification instructions and drawings and data required by CM and/or ILS and for compliance with airworthiness regulations</td> </tr> </table> | 4.1 | Report results of scoping, principles and techniques identification and evaluation of gas turbine engine power plant systems and system components | 4.2 | Provide documentation, such as modification instructions and drawings and data required by CM and/or ILS and for compliance with airworthiness regulations | | | | | | |
| 4.1 | Report results of scoping, principles and techniques identification and evaluation of gas turbine engine power plant systems and system components | | | | | | | | | | | |
| 4.2 | Provide documentation, such as modification instructions and drawings and data required by CM and/or ILS and for compliance with airworthiness regulations | | | | | | | | | | | |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aircraft gas turbine engine power plant includes:

- Engine
- Engine control system, including propeller, where applicable
- Engine lubricating oil supply and cooling system
- Inlet anti-icing system
- Propeller or rotor
- Engine control linkages and/or sensors

Aircraft gas turbine engine

power plant system components include:

- Oil tank
- Oil cooler
- Valves
- Lubrication oil plumbing
- Anti-ice ducting
- Anti-ice control valves
- Propeller hub and blades
- Propeller governor
- Pitch control
- Coordinator

Aircraft gas turbine engines

- Turbojet, turbofan, turboprop and turboshaft engines, including:
 - inlet and compressor section
 - combustion section
 - turbine section
 - exhaust section
 - ancillary section
 - power output shafts and propeller shafts
 - fuel control unit
 - engine lubrication
 - thrust augmentation

Standards and guidance material include:

- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- FAR Part 33 – Airworthiness Standards: Aircraft engines Subparts A,B, E, F
- FAR Part 35 – Airworthiness Standards: Propellers
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- EASA CS-E Certification Specifications for Engines Subparts A, D, E, F
- EASA CS-P Certification Specifications for Propellers
- CASA AC21.16(0) Approval of material, parts, processes and appliances
- CASA AC21.145(0) Manufacture of parts during the course of maintenance
- CASA AC21.601(0) Australian Technical Standards

- Order Authorisation
 - CASA CAAP35-7(0) Design approval of modifications and repairs
 - CASA AC 21-99 Aircraft Wiring and Bonding
 - FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair
- Configuration management (CM)**
- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life
- Integrated logistic support (ILS)**
- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface
- Appropriate technical and professional assistance includes:**
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
 - Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
 - Engineers employed within organisations recognised by overseas airworthiness organisations
- WHS, regulatory requirements and enterprise procedures include:**
- WHS Acts and regulations
 - Relevant standards
 - Industry codes of practice
 - Risk assessments
 - Registration requirements
 - Safe work practices
 - Civil Aviation Safety Regulations (CASRs)
 - AAP7001.053 ADF Technical Airworthiness

Management Manual

- Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Unit Mapping Information

Release 1 – new unit based on MEM23084A Apply scientific principles and techniques in aeronautical engineering situations and MEM23095A Apply aeronautical system design principles and techniques in aeronautical engineering situations – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA720 Evaluate aircraft gas turbine engine power plants

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying WHS, regulatory and risk management procedures, power plant design and construction principles, and maintenance requirements
- determining and confirming:
 - parameters and context of tasks
 - chain of responsibility
 - personal functions and responsibilities
 - team and support functional group interdependencies and communications
 - appropriate qualifications and delegations
 - appropriate support, including technical and professional assistance
- investigating associated CM and ILS requirements and drafting required data
- assessing and applying:
 - basic aircraft power plant and power plant system design procedures
 - design standards
 - regulatory requirements
 - graphics skills and techniques
- evaluating proposed modifications, repairs and power plant maintenance and reliability
- reporting and documenting results of scoping, principles and techniques identification and evaluation of applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft gas turbine engine power plant and power plant system design, function and layout:
 - design standards
 - gas turbine engine types and relative performance
 - system components and hardware
 - construction and assembly methods

- types of propeller and their applications
- basic design principles for:
 - system modifications
 - repair schemes
- airworthiness regulator design standards
- compliance requirements of the WHS Act and regulations, codes of practice, standards and risk assessment
- scope of trade, technical and professional support services required in aircraft power plant applications
- management data interface with CM and ILS.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and apply WHS, regulatory, risk management procedures
 - determine parameters and context of tasks, personal, team, licensed technical and professional assistance, support personnel functions and responsibilities, and chain of responsibility
 - investigate sustainability implications of aircraft gas turbine engine power plants as specified in CM and/or ILS requirements
 - assess and apply basic aircraft power plant design and maintenance/repair requirements, and graphics skills and techniques
 - evaluate aircraft gas turbine engine power plant and components for compliance with WHS and airworthiness regulatory requirements
 - report and document results, including provision of CM and ILS input data.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA721 Evaluate aircraft hydro-mechanical systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to hydraulic power, landing gear, fuel storage and distribution, water and waste, and mechanical systems and their components. It involves evaluation of systems and components for compliance with design and performance standards and with airworthiness regulatory requirements within both civil and military environments.

Also covered is documentation of the evaluation process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working as paraprofessionals within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations (AEOs), and for those pursuing qualifications or careers in those fields.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA710	Apply aeronautical system design techniques
MEM23004A	Apply technical mathematics
MEM23007A	Apply calculus to engineering tasks

Competency Field

Unit Sector

Elements and Performance Criteria

Elements describe the essential Performance criteria describe the performance needed to

outcomes.	demonstrate achievement of the element.
1. Prepare to evaluate aircraft hydro-mechanical system	<ul style="list-style-type: none">1.1 Confirm and apply safe working practices relating to hydraulic, fuel and mechanical systems1.2 Determine parameters and context of applications and purpose of evaluation1.3 Confirm personal functions and responsibilities, team and support functional group interdependencies and communications1.4 Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available1.5 Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines1.6 Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice, performance requirements and standards, including airworthiness regulatory requirements for hydro-mechanical systems, risk management and organisational procedures
2. Identify principles and techniques required for evaluation of aircraft hydro-mechanical system	<ul style="list-style-type: none">2.1 Identify features and functions of aircraft hydro-mechanical systems and components2.2 Review aircraft hydro-mechanical system design and layout requirements and techniques2.3 Identify system electrical control power requirements and interfaces with other systems
3. Evaluate aircraft hydro-mechanical system applications	<ul style="list-style-type: none">3.1 Evaluate proposed modifications to aircraft hydro-mechanical systems and system components3.2 Evaluate aircraft hydro-mechanical system and system component maintenance requirements3.3 Evaluate aircraft hydro-mechanical system and system component reliability and defect history3.4 Evaluate proposed component substitutions3.5 Evaluate application for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to

risk management

- | | | | |
|----|----------------|-----|---|
| 4. | Report results | 4.1 | Report results of scoping, principles and techniques identification and evaluation of applications |
| | | 4.2 | Provide documentation, such as system schematics, software, wiring diagrams and data required by CM and/or ILS, and as required for compliance with airworthiness regulations |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aircraft hydro-mechanical systems include:

- Hydraulic pressure generation and distribution
- Landing gear retraction
- Brake and anti-skid
- Nose wheel steering
- Door operation and locking including integral stairs
- Fuel distribution and management including single point refuelling
- Water and waste
- Interfaces with other aircraft systems and with electrical and instrument systems

Aircraft hydro-mechanical system components include:

- Hydraulic pumps
- Filters
- Valves
- Accumulators
- Actuators
- Plumbing
- Reservoirs
- Shock struts
- Brake units
- Anti-skid units
- Door locking mechanisms

Standards and guidance material include:

- Fuel valves
 - Fuel plumbing
 - Fuel tanks other than integral tanks
 - Mechanical linkages, cables and hardware
 - Sensors
 - Indicators, lights and switches
 - ADF AAP7001.054 Airworthiness Design Requirements Manual
 - FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
 - FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
 - FAR Part 27 Airworthiness Standards for Rotorcraft in the Normal Category
 - FAR Part 29 Airworthiness Standards for Rotorcraft in the Transport Category
 - EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
 - EASA CS-25 Certification Specifications for Airplanes in the Transport Category
 - EASA CS-27 Certification Specifications for Rotorcraft in the Normal Category
 - EASA CS-29 Certification Specifications for Rotorcraft in the Transport Category
 - CASA AC21.16(0) Approval of material, parts, processes and appliances
 - CASA AC21.145(0) Manufacture of parts during the course of maintenance
 - CASA AC21.601(0) Australian Technical Standards Order Authorisation
 - CASA CAAP35-7(0) Design approval of modifications and repairs
 - CASA AC 21-99 Aircraft Wiring and Bonding
 - FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair
- Configuration management (CM)**
- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life
- Integrated logistic support (ILS)**
- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:

- reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface
- Appropriate technical and professional assistance includes:**
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
 - Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
 - Engineers employed within organisations recognised by overseas airworthiness organisations
- WHS, regulatory requirements and enterprise procedures include:**
- WHS Acts and regulations
 - Relevant standards
 - Industry codes of practice
 - Risk assessments
 - Registration requirements
 - Safe work practices
 - Civil Aviation Safety Regulations (CASRs)
 - AAP7001.053 ADF Technical Airworthiness Management Manual
 - Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Unit Mapping Information

Release 1 – new unit based on MEM23084A Apply scientific principles and techniques in aeronautical engineering situations and MEM23095A Apply aeronautical system design principles and techniques in aeronautical engineering situations – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
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Assessment Requirements for MEA721 Evaluate aircraft hydro-mechanical systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying WHS, regulatory and electrical safety requirements, risk management procedures, features and functions of aircraft hydro-mechanical systems and components, and system design principles and techniques, including:
 - performance and operating environment
 - system control
 - indicating and circuit protection requirements
 - interface requirements between aircraft hydro-mechanical systems and other systems, including the electrical power distribution
- determining and confirming:
 - parameters and context of tasks
 - chain of responsibility
 - personal functions and responsibilities
 - team and support functional group interdependencies and communications
 - appropriate qualifications and delegations
 - appropriate support, including technical and professional assistance
- investigating associated CM and ILS requirements and drafting required data
- identifying and drafting data required for compliance with airworthiness regulations
- assessing and applying:
 - basic aircraft hydro-mechanical system performance analysis and design procedures
 - design standards
 - regulatory requirements
 - graphics skills and techniques
- evaluating system components and specifications against system design and operating criteria
- reporting and documenting results of scoping, principles and techniques identification and evaluation of applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- features and layout of aircraft hydro-mechanical systems, including control, indication and interface with other systems:
 - hydraulic power
 - landing gear shock absorbing and retraction
 - brakes
 - nose wheel steering
 - door operation
 - fuel
 - water and waste
- basic design principles for:
 - hydraulic pressure generation and distribution systems and components
 - landing gear shock absorbing struts and retraction systems, including actuators and mechanical linkages
 - brakes and anti-skid systems and system components
 - nose wheel steering systems and system components
 - door operation and locking systems and components/mechanical linkages
 - fuel storage, distribution and management systems, including system components
 - water and waste systems including system components
- interface with the aircraft electrical and instrument systems
- wiring types, standards and specifications
- performance and operating environment effects
- airworthiness regulator design standards
- compliance requirements of the WHS Act and regulations, codes of practice, standards, risk assessment
- scope of trade, technical and professional support services required in aircraft hydro-mechanical system applications
- management data interface with CM and ILS.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.

- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and apply WHS, regulatory and risk management procedures
 - determine parameters and context of tasks, personal, team, technical and professional assistance and support, personnel functions and responsibilities, and chain of responsibility
 - investigate sustainability implications of aircraft hydro-mechanical system applications as specified in CM and/or ILS requirements
 - assess and apply basic aircraft hydro-mechanical system design and maintenance/repair requirements, software basic analysis and graphics skills and techniques
 - evaluate aircraft hydro-mechanical systems and components for compliance with WHS and airworthiness regulatory requirements
 - report and document results, including provision of CM and ILS input data.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
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ME A722 Evaluate aircraft piston engine power plants

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to aircraft piston engines, engine controls, air inlet, cooling, lubrication and propeller systems, and components thereof. It involves evaluation of power plants and components for compliance with design standards and with airworthiness regulatory requirements within both civil and military environments.

Also covered is documentation of the evaluation process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working as paraprofessionals within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations (AEOs), and for those pursuing qualifications or careers in those fields.

Where the engine is installed in a rotorcraft the interface between the engine throttle/governor and the rotor controls is covered in ME A718 Evaluate rotorcraft flight control system.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME A710	Apply aeronautical system design techniques
MEM23004A	Apply technical mathematics
MEM23007A	Apply calculus to engineering tasks

Competency Field

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Prepare to evaluate piston engine power plant | 1.1 | Confirm and apply safe working practices relating to aircraft structure |
| | | 1.2 | Determine parameters and context of applications and purpose of evaluation |
| | | 1.3 | Confirm personal functions and responsibilities, team and support functional group interdependencies and communications |
| | | 1.4 | Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available |
| | | 1.5 | Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines |
| | | 1.6 | Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice and standards, including airworthiness regulatory requirements for aircraft piston engine power plant, risk management and organisational procedures |
| 2. | Identify principles and techniques required for evaluation of aircraft piston engine power plant | 2.1 | Identify features and functions of power plant and related systems |
| | | 2.2 | Review piston engine and engine system operation, layout and performance |
| | | 2.3 | Review engine control system design and function, including interface with full authority digital engine control systems |
| | | 2.4 | Review propeller and propeller control system design and function |
| | | 2.5 | Review engine air inlet system design and function |

- | | | |
|---|-----|---|
| | 2.6 | Review engine cooling system design and function |
| | 2.7 | Review engine dry sump lubricating system design and function |
| 3. Evaluate aircraft piston engine power plant and components | 3.1 | Evaluate proposed modifications and repairs to power plant systems and components |
| | 3.2 | Evaluate power plant maintenance requirements |
| | 3.3 | Evaluate power plant reliability and defect history |
| | 3.4 | Evaluate proposed component substitutions |
| | 3.5 | Evaluate for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management |
| 4. Report results | 4.1 | Report results of scoping, principles and techniques identification and evaluation of piston engine power plant systems and system components |
| | 4.2 | Provide documentation, such as modification instructions and drawings and data required by CM and/or ILS, and for compliance with airworthiness regulations |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aircraft piston engine power plant includes:

- Engine
- Engine control system
- Propeller control system
- Dry sump engine lubricating oil supply and cooling system

Aircraft piston engine power plant system components include:

- Air inlet system
- Cooling system
- Propeller or rotor
- Engine control linkages and/or sensors
- Oil tank
- Oil cooler
- Coolant tank and radiator
- Control valves
- Lubrication oil plumbing
- Air inlet ducting, filters and doors
- Air inlet heating
- Propeller hub and blades
- Propeller governor
- Pitch control

Aircraft piston engines include:

- Two and four stroke petrol and diesel engines, including:
 - the bare engine
 - carburettor or fuel injection system
 - supercharging/turbocharging systems
 - ignition system (petrol engines)
 - starting system
 - ancillary gear box
 - reduction gear and propeller shaft

Standards and guidance material include:

- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- FAR Part 33 – Airworthiness Standards: Aircraft engines Subparts A,B, C, D
- FAR Part 35 – Airworthiness Standards: Propellers
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- EASA CS-E Certification Specifications for Engines Subparts A, B, C
- EASA CS-P Certification Specifications for Propellers
- CASA AC21.16(0) Approval of material, parts, processes and appliances
- CASA AC21.145(0) Manufacture of parts during the

- course of maintenance
- CASA AC21.601(0) Australian Technical Standards Order Authorisation
 - CASA CAAP35-7(0) Design approval of modifications and repairs
 - CASA AC 21-99 Aircraft Wiring and Bonding
 - FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair
- Configuration management (CM)**
- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life
- Integrated logistic support (ILS)**
- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface
- Appropriate technical and professional assistance includes:**
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
 - Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
 - Engineers employed within organisations recognised by overseas airworthiness organisations
- WHS, regulatory requirements and enterprise procedures include:**
- WHS Acts and regulations
 - Relevant standards
 - Industry codes of practice
 - Risk assessments
 - Registration requirements
 - Safe work practices

- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities where applicable e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Unit Mapping Information

Release 1 – New unit based on MEM23084A Apply scientific principles and techniques in aeronautical engineering situations and MEM23095A Apply aeronautical system design principles and techniques in aeronautical engineering situations – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA722 Evaluate aircraft piston engine power plants

Modification History

Release 1 - New unit of competency

Performance Evidence

- Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:
- identifying WHS, regulatory and risk management procedures, power plant design and construction principles and maintenance requirements
- determining and confirming:
 - parameters and context of tasks
 - chain of responsibility
 - personal functions and responsibilities
 - team and support functional group interdependencies and communications
 - appropriate qualifications and delegations
- appropriate support, including technical and professional assistance
- investigating associated CM and ILS requirements and drafting required data
- assessing and applying:
 - basic aircraft power plant and power plant system design procedures
 - design standards
 - regulatory requirements
 - graphics skills and techniques
- evaluating proposed modification and power plant maintenance and reliability
- reporting and documenting results of scoping, principles and techniques identification and evaluation of applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft piston engine power plant and power plant system design, function and layout:
 - design standards
 - piston engine types and relative performance
 - system components and hardware
 - construction and assembly methods
 - types of propeller and their applications

- basic design principles for:
 - system modifications
 - repair schemes
- airworthiness regulator design standards
- compliance requirements of the WHS Act and regulations, codes of practice, standards and risk assessment
- scope of trade, technical and professional support services required in aircraft power plant applications
- management data interface with CM and ILS.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and apply WHS, regulatory and risk management procedures
 - determine parameters and context of tasks, personal, team, technical and professional assistance and support, personnel functions and responsibilities, and chain of responsibility
 - investigate sustainability implications of aircraft piston engine power plants as specified in CM and/or ILS requirements
 - assess and apply basic aircraft piston engine power plant design and maintenance/repair requirements, and graphics skills and techniques
 - evaluate aircraft piston engine power plant components for compliance with WHS and airworthiness regulatory requirements
 - report and document results, including provision of CM and ILS input data.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME723 Evaluate aircraft pneumatic systems

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to pneumatic air supply, air cycle air conditioning, pressurisation, anti-ice and actuating systems, and their components. It involves evaluation of systems and components for compliance with design and performance standards and with airworthiness regulatory requirements within both civil and military environments.

Also covered is documentation of the evaluation process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working as paraprofessionals within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations (AEOs), and for those pursuing qualifications or careers in those fields.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

ME710	Apply aeronautical system design techniques
MEM23004A	Apply technical mathematics
MEM23007A	Apply calculus to engineering tasks

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|---|
| 1. | Determine scope of aircraft pneumatic system applications for evaluation | 1.1 | Confirm and apply safe working practices relating to aircraft pneumatic systems |
| | | 1.2 | Determine parameters and context of applications and purpose of evaluation |
| | | 1.3 | Confirm personal functions and responsibilities, team and support functional group interdependencies and communications |
| | | 1.4 | Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available |
| | | 1.5 | Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines |
| | | 1.6 | Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice, performance requirements and standards, including airworthiness regulatory requirements for pneumatic systems, risk management and organisational procedures |
| 2. | Identify principles and techniques required for evaluation of aircraft pneumatic system applications | 2.1 | Identify features and functions of aircraft pneumatic systems and components |
| | | 2.2 | Review aircraft pneumatic system design and layout requirements and techniques |
| | | 2.3 | Identify system electrical control power requirements |
| 3. | Evaluate aircraft pneumatic system applications | 3.1 | Evaluate system requirements and operating environment |
| | | 3.2 | Evaluate suitability of components |
| | | 3.3 | Evaluate suitability of aircraft pneumatic systems and components, including control, indication and interface with other systems |

- | | | |
|----|----------------|--|
| | 3.4 | Evaluate application for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management |
| 4. | Report results | |
| | 4.1 | Report results of scoping, principles and techniques identification and evaluation of applications |
| | 4.2 | Provide documentation, such as system schematics, wiring diagrams and data required by CM and/or ILS |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aircraft pneumatic systems include:

- Pneumatic air source and distribution
- Air cycle air conditioning
- Pressurisation
- Anti-ice
- Landing gear retraction
- Brakes
- Interfaces with other aircraft systems and with electrical and instrument systems

Aircraft pneumatic system components include:

- Air pumps
- Engine bleed air valves
- Filters
- Valves
- Heat exchangers
- Pressurisation outflow valves
- Pressurisation safety valves
- Pressurisation controllers
- Actuators
- Ducting and plumbing
- Reservoirs

- Brake units
 - Mechanical linkages, cables and hardware
 - Sensors
 - Indicators, lights and switches
- Standards and guidance material include:**
- ADF AAP7001.054 Airworthiness Design Requirements Manual
 - FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
 - FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
 - FAR Part 27 Airworthiness Standards for Rotorcraft in the Normal Category
 - FAR Part 29 Airworthiness Standards for Rotorcraft in the Transport Category
 - EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
 - EASA CS-25 Certification Specifications for Airplanes in the Transport Category
 - EASA CS-27 Certification Specifications for Rotorcraft in the Normal Category
 - EASA CS-29 Certification Specifications for Rotorcraft in the Transport Category
 - CASA AC 21-99 Aircraft Wiring and Bonding
 - FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair
- Configuration management (CM)**
- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life
- Integrated logistic support (ILS)**
- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities

- packaging, handling, storage and transportation
 - design interface
- Appropriate technical and professional assistance includes:**
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
 - Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF regulatory system
 - Engineers employed within organisations recognised by overseas airworthiness organisations
- WHS, regulatory requirements and enterprise procedures include:**
- WHS Acts and regulations
 - Relevant standards
 - Industry codes of practice
 - Risk assessments
 - Registration requirements
 - Safe work practices
 - Civil Aviation Safety Regulations (CASRs)
 - AAP7001.053 ADF Technical Airworthiness Management Manual
 - Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Unit Mapping Information

Release 1 – new unit based on MEM23084A Apply scientific principles and techniques in aeronautical engineering situations and MEM23095A Apply aeronautical system design principles and techniques in aeronautical engineering situations – units not equivalent

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA723 Evaluate aircraft pneumatic systems

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying WHS, regulatory and electrical safety requirements, risk management procedures, features and functions of aircraft pneumatic systems and components, and system design principles and techniques, including:
 - performance and operating environment
 - system control
 - indicating and circuit protection requirements
 - interface requirements between aircraft pneumatic systems and other systems, including electrical power distribution
- determining and confirming:
 - parameters and context of tasks
 - chain of responsibility
 - personal functions and responsibilities
 - team and support functional group interdependencies and communications
 - appropriate qualifications and delegations
 - appropriate support, including technical and professional assistance
- investigating associated CM and ILS requirements and drafting required data
- assessing and applying:
 - basic aircraft pneumatic system performance analysis and design procedures
 - design standards
 - regulatory requirements
 - graphics skills and techniques
- evaluating system components and specifications against system design and operating criteria
- reporting and documenting results of scoping, principles and techniques identification and evaluation of applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- features and layout of aircraft pneumatic systems, including control, indication and interface with other systems:
 - bleed air and air pumps
 - air cycle air conditioning
 - pressurisation
 - anti-ice
 - landing gear retraction
 - brakes
- basic design principles for:
 - pneumatic air source and distribution systems and components
 - air cycle air conditioning systems and components
 - pressurisation systems and components
 - anti-ice systems and components
 - landing gear retraction systems, including actuators and mechanical linkages
 - brakes and system components
- interface with the aircraft electrical and instrument systems
- wiring types, standards and specifications
- performance and operating environment effects
- airworthiness regulator design standards
- compliance requirements of the WHS Act and regulations, codes of practice, standards and risk assessment
- scope of trade, technical and professional support services required in aircraft pneumatic system applications
- management data interface with CM and ILS.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.

- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and apply WHS, regulatory and risk management procedures
 - determine parameters and context of tasks, personal, team, licensed technical and professional assistance and support, personnel functions and responsibilities, and chain of responsibility
 - investigate sustainability implications of aircraft pneumatic system applications as specified in CM and/or ILS requirements
 - assess and apply basic aircraft pneumatic system design and maintenance/repair requirements, and graphics skills and techniques
 - evaluate aircraft pneumatic systems and components for compliance with WHS and airworthiness regulatory requirements
 - report and document results, including provision of CM and ILS input data.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA724 Evaluate aircraft structure

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to aircraft primary, secondary and tertiary structure and related structural components. It involves evaluation of structure and structural components for compliance with design standards and with airworthiness regulatory requirements within both civil and military environments.

Also covered is documentation of the evaluation process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working as paraprofessionals within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations (AEOs), and for those pursuing qualifications or careers in those fields.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA709	Apply aeronautical structure design techniques
MEM234019A	Apply finite element analysis in engineering design
MEM234022A	Apply advanced calculus to technology problems

Competency Field

Unit Sector

Elements and Performance Criteria

Elements describe the essential Performance criteria describe the performance needed to

outcomes.		demonstrate achievement of the element.
1.	Prepare to evaluate structure	<p>1.1 Confirm and apply safe working practices relating to aircraft structure</p> <p>1.2 Determine parameters and context of applications and purpose of evaluation</p> <p>1.3 Confirm personal functions and responsibilities, team and support functional group interdependencies and communications</p> <p>1.4 Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available</p> <p>1.5 Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines</p> <p>1.6 Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice and standards, including airworthiness regulatory requirements for aircraft structure, risk management and organisational procedures</p>
2.	Identify principles and techniques required for evaluation of aircraft structure	<p>2.1 Identify features and functions of aircraft structure and structural components</p> <p>2.2 Review aircraft structural design, layout and assembly requirements and techniques</p> <p>2.3 Identify requirements applicable to ageing aircraft structural inspection and maintenance</p>
3.	Evaluate aircraft structure and structural components	<p>3.1 Evaluate proposed modifications to structure and structural components</p> <p>3.2 Evaluate structural maintenance requirements</p> <p>3.3 Evaluate structural damage and defect history</p> <p>3.4 Evaluate proposed repair schemes and extensions to existing schemes</p> <p>3.5 Evaluate for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management</p>

- | | | | |
|----|----------------|-----|---|
| 4. | Report results | 4.1 | Report results of scoping, principles and techniques identification and evaluation of structure and structural components |
| | | 4.2 | Provide documentation, such as modification instructions and drawings, repair scheme instructions and drawings and data required by CM and/or ILS |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Aircraft structure includes:

- Primary structure
- Secondary structure
- Tertiary structure
- Assembly and attachment hardware

Aircraft structural components include:

- Fuselage
- Wings
- Tailplane
- Fin
- Flight control surfaces
- Flaps
- Doors
- Access panels
- Engine nacelles
- Pylons
- Fairings
- Windscreens and windows
- Bearings, assembly and attachment hardware
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in

Standards and guidance material include:

the Transport Category

- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- CASA AC21.16(0) Approval of material, parts, processes and appliances
- CASA AC21.145(0) Manufacture of parts during the course of maintenance
- CASA AC21.601(0) Australian Technical Standards Order Authorisation
- CASA CAAP35-7(0) Design approval of modifications and repairs
- CASA AC 21-99 Aircraft Wiring and Bonding
- FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair
- MIL-HDBK-1530A (USAF) Aircraft Structural Integrity Program General Guidelines For

Configuration management (CM)

- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life

Integrated logistic support (ILS)

- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface

Appropriate technical and professional assistance includes:

- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
- Professional support from engineers employed within:
 - organisations with CASA continuing airworthiness

- management or maintenance approvals
- approved engineering organisations under the ADF regulatory system
 - Engineers employed within organisations recognised by overseas airworthiness organisations
 - WHS Acts and regulations
 - Relevant standards
 - Industry codes of practice
 - Risk assessments
 - Registration requirements
 - Safe work practices
 - Civil Aviation Safety Regulations
 - AAP7001.053 ADF Technical Airworthiness Management Manual
 - Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency
- WHS, regulatory requirements and enterprise procedures include:**

Unit Mapping Information

Release 1 – New unit based on MEM23084A Apply scientific principles and techniques in aeronautical engineering situations and MEM23095A Apply aeronautical system design principles and techniques in aeronautical engineering situations – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA724 Evaluate aircraft structure

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying WHS, regulatory and risk management procedures, structural design and construction principles, and ageing aircraft structure inspection and maintenance requirements
- determining and confirming:
 - parameters and context of tasks
 - chain of responsibility
 - personal functions and responsibilities
 - team and support functional group interdependencies and communications
 - appropriate qualifications and delegations
 - appropriate support, including technical and professional assistance
- investigating associated CM and ILS requirements and drafting required data
- assessing and applying:
 - basic aircraft structural analysis and design procedures
 - design standards
 - regulatory requirements
 - graphics skills and techniques
- evaluating proposed modification and repair schemes
- reporting and documenting results of scoping, principles and techniques identification and evaluation of applications.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- aircraft structural design and construction:
 - design standards and manufacturer's stress analysis
 - structural materials
 - structural hardware
 - construction and assembly methods

- sealants and surface finishing schemes
- basic design principles for:
 - structural modifications
 - repair schemes and extensions to existing schemes
- ageing aircraft structural inspection and maintenance requirements
- airworthiness regulator design standards
- compliance requirements of the WHS Act and regulations, codes of practice, standards and risk assessment
- scope of trade, technical and professional support services required in aircraft structural applications
- management data interface with CM and ILS.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify and apply WHS, regulatory and risk management procedures
 - determine parameters and context of tasks, personal, team, technical and professional assistance and support, personnel functions and responsibilities, and chain of responsibility
 - investigate sustainability implications of aircraft structure as specified in CM and/or ILS requirements
 - assess and apply basic aircraft structural design and maintenance/repair requirements, and graphics skills and techniques
 - evaluate aircraft structure and structural components for compliance with WHS and airworthiness regulatory requirements
 - report and document results, including provision of CM and ILS input data.
- Assessment may be in conjunction with assessment of other units of competency where required.

- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA725 Apply advanced scientific principles and techniques in avionic engineering situations

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to selecting and applying advanced avionic scientific principles and techniques.

Computer techniques, graphical methods and mathematical calculations should complement scientific principles chosen and include unit analysis, appropriate precision and accuracy and use conservative estimations.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA706 Apply basic scientific principles and techniques in avionic engineering situations

MEA727 Apply calculus in avionic engineering situations

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes. Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|---|-----|--|
| 1. | Identify the range of scientific principles and | 1.1 | Identify the scientific principles relating to avionic engineering |
|----|---|-----|--|

techniques relevant to avionic engineering	1.2	Research and report on avionic scientific principles using appropriate sources of information
	1.3	Identify the techniques and associated technologies, software and hardware associated with implementing scientific principles relating to avionic engineering applications
	1.4	Research and report on avionic techniques using appropriate sources of information
2. Select scientific principles and techniques	2.1	Select relevant scientific principles for specific avionic engineering situations
	2.2	Select relevant avionic techniques and associated technologies, software and hardware for specific avionic engineering situations
3. Apply the relevant scientific principles and techniques	3.1	Apply applicable scientific principles in a consistent and appropriate manner to obtain any required solution
	3.2	Use appropriate calculations and correct units to establish quantities
	3.3	Use coherent units in equations in a systematic manner to ensure meaningful solutions
	3.4	Use significant figures in engineering calculations
	3.5	Obtain required solutions by applying chosen techniques and associated technologies, software and hardware in a consistent and appropriate manner
4. Document the results of the application of the avionic scientific principles and techniques	4.1	Document solutions involving engineering calculations in an appropriate style
	4.2	Document solutions not involving engineering calculations in an appropriate style

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Sources of information include:

- Reference texts
- Manufacturer's catalogues and industrial magazines
- Internet search engines and websites
- Email
- The use of phone and fax
- Airworthiness and design authority regulations and associated advisory material

Avionic engineering refers to:

- The engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace electrical, instrument, radio and electronic systems and components and related test equipment for civil and military applications

Avionic engineering applications refer to:

- The description or definition of an objective or challenge within a real or simulated engineering environment or state requiring a conceptual development, design, manufacture and/or implementation and/or installation, commissioning and maintenance response to affect a solution or improvement with regard to:
 - electrical systems and related wiring and components (power generation, distribution, control interfaces with hydraulic and pneumatic systems, and caution and warning systems)
 - mechanical and electro-mechanical flight instruments and indication systems (quantity, pressure, temperature and position) and components
 - electronic systems and components (communications, radio navigation, pulse, display, automatic flight control, flight management and engine management)
 - automatic test stations, adapters and software

Unit Mapping Information

Release 1 – new unit based on and equivalent to MEM23085A Apply scientific principles and techniques in avionic engineering situations

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA725 Apply advanced scientific principles and techniques in avionic engineering situations

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying advanced scientific principles relevant to avionic engineering
- analysing the given situation to determine what is required in the manner of a solution
- analysing the given situation to determine which avionic scientific principles are selected
- selecting appropriate avionic techniques and associated technologies, software and hardware to suit the application
- applying appropriate avionic principles in determining the required solution
- applying and manipulating formulas and calculations for engineering applications
- using the correct units to solve engineering calculations
- checking the validity of equations using a systematic method for ensuring coherent units
- applying avionic techniques and associated technologies, software and hardware in a manner appropriate to the application and identified scientific principles
- referring solutions to the original aim of the application
- quoting solutions in appropriate units and using appropriate significant figures
- presenting solutions referring to the original aim of the application.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- physics – analysis and application of:
 - linear kinematics
 - planar kinematics
 - Newton's Laws of Motion
 - friction
 - momentum and center of gravity
 - gravity
 - circular motion
 - orbital motion
 - rotational motion

- oscillation
- electronic fundamentals – determination of required values and characteristics for:
 - resistors, including light and voltage dependent resistors
 - capacitors
 - inductors
 - transformers
 - diodes
 - transistors
 - power amplifiers
 - oscillators
 - silicon controlled rectifiers
 - thyristor power control circuits
 - opto-couplers
- selection of appropriate test equipment
- digital electronics – design, construction and testing of:
 - clocked sequential circuits
 - registers
 - oscillators
 - timers
 - interfacing circuits
 - program logic array
 - state machines
- data communications – analysis and application of:
 - selection of data transmission methods
 - universal asynchronous receiver transmitter construction
 - multiplexers and demultiplexers
 - data encryption/decryption theory
- electronic circuit analysis
- aerodynamics – application of:
 - drag and speed
 - power/thrust available and power/thrust required
 - manoeuvring flight
 - stability and control
- strength of materials – application of:
 - bending and shear in beams
 - forces in trusses and frames
 - engineering concepts of stress and strain
 - properties of areas
 - torsion
 - mechanical properties of materials

- two dimensional stress and strain, including elastic constants
- computer software/programming – application of:
 - high level languages
 - algorithm design and testing
 - Pascal and Turbo-Pascal programming
- the limitations of avionic techniques and associated technologies, software and hardware
- the procedure for ensuring coherent units for meaningful solutions to equations
- the concept of significant figures
- the uncertainty of computations based on experimental data
- the procedures for determining the significance of figures in calculations
- the procedures for estimating errors in derived quantities
- the method of application of the avionic techniques and associated technologies, software and hardware
- the application of the calculation solution style
- the significance of the non-calculation solution style.

Assessment Conditions

- 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, a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors should ensure that candidates can:
 - consistently select and apply appropriate scientific principles in avionic engineering situations
 - document in an appropriate style the solutions obtained through the application of chosen scientific principles in avionic engineering situations.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEA726 Apply aircraft electrical system design techniques

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to design of aircraft electrical systems and components for aircraft, design of modifications and development, and update of test procedures and of repair requirements. It includes electrical design techniques and performance of the design process within the requirements of airworthiness regulators and documentation of the design process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working as members of design teams and for those employed within maintenance engineering support departments or pursuing careers and qualifications as paraprofessionals in avionic engineering.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEA702	Produce avionic engineering related graphics
MEA706	Apply basic scientific principles and techniques in avionic engineering situations
MEA708	Select and test avionic engineering materials
MEA714	Integrate avionic fundamentals into an engineering task
MEA725	Apply advanced scientific principles and techniques in avionic engineering situations

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|--|
| 1. | Investigate requirements of aircraft electrical system design projects | 1.1 | Review the context and negotiate parameters of the engineering design brief in consultation with stakeholders |
| | | 1.2 | Determine engineering scientific principles and design techniques required for design process |
| | | 1.3 | Investigate life-cycle design and sustainability implications of avionic design |
| | | 1.4 | Determine specification, documentation and graphical techniques required to define designs |
| | | 1.5 | Confirm work health and safety (WHS) and regulatory requirements, codes of practice, standards, risk management and registration requirements relevant to avionic design project |
| | | 1.6 | Investigate the need for technical and professional assistance |
| 2. | Apply aircraft electrical system design techniques | 2.1 | Plan, schedule and coordinate the design task |
| | | 2.2 | Apply the design process and avionic scientific principles to component selection and design proposals |
| | | 2.3 | Create adequate and accurate calculations, preliminary graphics and maintain design process records |
| | | 2.4 | Evaluate multiple solutions against design criteria, risk, sustainability and cost |
| | | 2.5 | Integrate avionic analogue techniques, hardware and software, including mechanical, fluid, electrical, electronic, controller and networking |
| | | 2.6 | Apply systems thinking, problem solving and decision making in dealing with contingencies and constraints for continuous improvement and development of design options |

- 2.7 Incorporate professional and technical assistance as required
 - 2.8 Apply specification, documentation and graphical techniques modelling, mock-up or prototyping techniques to define designs
 3. Report results
 - 3.1 Report results of investigations, application and development of avionic design
 - 3.2 Provide documentation, such as calculations, specifications, diagrams, computer-aided design (CAD) files, control circuits and controller programs, mock-ups or prototypes
 - 3.3 Draft documentation required by CM plan and/or ILS process

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Avionic engineering refers to:

- The engineering discipline concerned with the conceptual development, research, design, manufacture, implementation, installation, commissioning and maintenance of aerospace electrical, instrument, radio and electronic systems and components and related test equipment for civil and military applications

Aircraft electrical systems include:

- Electrical power generation
- Control and distribution
- Interface with aircraft systems, including hydraulic, pneumatic, power plant and flight controls
- Interface with avionic analogue systems
- Interface with avionic digital systems

Context of engineering design activity includes:

- Competitive market
- Geo political factors, such as access to materials and

markets

- Technological advantage/disadvantage
- Resources supply: materials, labour and skills
- Sustainability issues relevant to design task, including
 - social, economic and environmental considerations
 - material and energy resources
- WHS, risk, and applicable standards and code requirements

Planning processes include:

- Establishing design parameters and design criteria
- Contributing to the negotiation and advice process
- Preliminary planning, design investigations and costing
- Identifying design, development, prototyping activities and skills requirements
- Planning and scheduling design activities
- Improving, adjusting, rescheduling as required by emergency contingencies and constraints

Design process includes:

- Establishing design parameters and criteria
- Researching, measuring, experimenting and investigating
- Generating ideas
- Synthesis, problem solving and decision making, addressing constraints
- Applying scientific principles, calculation and graphics, prototyping and mock-up techniques
- Evaluating solutions against design criteria
- Consultation, adjustments and agreement
- Finalising design and sign-off

Design criteria include:

- Function
- Aesthetics
- Manufacturability and maintainability
- Marketability
- Sustainability:
 - social, economic and environmental
 - material and energy resources
- Cost constraints
- Ergonomics and anthropometrics and physiology
- Facilities, plant and skills available
- Safety and risk

Design analysis includes:

- Graphical and mathematical methods and software options associated with mechanical, electrical and electronic aspects of aircraft electrical systems

Sustainability considerations include:

- Resources and energy required for design
- Environmental considerations in manufacturing and

- operation of design:
- raw material, solids and hazardous waste, and production by-products
 - potential contamination of land, air and stormwater pollutants, and discharge to sewerage
 - carbon pollution and reduction effects
- Configuration management (CM)**
- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life
- Integrated logistic support (ILS)**
- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
 - reliability engineering, maintainability engineering and maintenance planning
 - supply and support
 - support and test equipment
 - manpower and personnel
 - training and training support
 - technical data and publications
 - computer resources support
 - facilities
 - packaging, handling, storage and transportation
 - design interface
- Life-cycle assessment is applied to:**
- All aspects of manufacture of a single product
 - The entire operations of an organisation
 - A particular aspect of operations, such as environmental implications
 - As part of the ILS process
- Prototyping includes:**
- Mock-ups
 - Physical and virtual modelling with post-processing for computer-numerically controlled (CNC) and rapid prototyping
- Appropriate technical and professional assistance includes:**
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
 - Professional support from engineers employed within:
 - organisations with CASA design approvals, continuing airworthiness management or maintenance approvals
 - approved engineering organisations under the ADF

regulatory system

WHS, regulatory requirements and enterprise procedures include:

- Engineers employed within organisations recognised by overseas airworthiness organisations
- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- State and territory regulatory requirements applying to electrical work
- Civil Aviation Safety Regulations (CASRs)
- AAP7001.053 ADF Technical Airworthiness Management Manual
- Overseas airworthiness authorities where applicable e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

Relevant standards include:

- AS 1100.101-1992 Technical drawing – General principles
- AS 1102.101-1989 Graphical symbols for electrotechnical documentation - General information and general index
- AS/NZS ISO 31000 Set:2013 Risk Management Set
- NOHSC:1014 National standard for the control of major hazard facilities
- AS/NZS ISO 14000 Basic Set:2007 Environmental Management Basic Set
- ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework
- AS 61508.1-2011 Functional safety of electrical/ electronic/ programmable electronic safety related systems – General requirements
- AS 62061-2006 Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems
- MIL-STD 785 Reliability program for systems and equipment development and production
- MIL-STD 1388-1A Logistic Support Analysis (LSA)
- MIL-STD 1388-2B Requirements for a LSA record
- MIL-STD 1629A Procedures for performing a failure mode, effects and criticality analysis (FMECA)
- MIL-STD 1629B FMECA
- MIL-STD 2173 Reliability centred maintenance requirements (superseded by NAVAIR 00-25-403)

Relevant handbooks include:

- OPNAVINST 4130.2A
- Integrated Logistic Support Handbook, third edition – James V Jones
- MIL-HDBK-217 Reliability prediction of electronic equipment
- MIL-HDBK-338B Electronic reliability design handbook
- MIL-HDBK-781A Reliability test methods, plans and environments for engineering development, qualification and production
- NASA PRA Probabilistic risk assessment handbook
- NASA Fault tree assessment handbook

Systems thinking includes:

- The process of developing solutions within the context of an entire system
- Recognising that an improvement in one subsystem can adversely affect another subsystem

Unit Mapping Information

Release 1 - new unit based on MEM14066A Plan and design avionic engineering projects – units not equivalent

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA726 Apply aircraft electrical system design techniques

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- communicating, negotiating and reviewing context and parameters of the engineering design brief with stakeholders
- determining or confirming scientific principles and design techniques, WHS and regulatory requirements, and design specification requirements
- evaluating multiple solutions against design criteria, risk, sustainability and cost
- investigating life-cycle design and sustainability, technical and professional assistance required
- investigating CM and/or ILS requirements
- planning, scheduling and coordinating the electrical system design task
- applying design process and scientific principles to component selection and design proposals for components and aircraft electrical systems
- solving problems and making decisions with systems thinking for contingencies, constraints and continuous improvement
- integrating aircraft electrical hardware and components into aircraft electrical systems
- defining designs, specifying, documenting and applying graphical techniques, modelling, mock-up or prototyping techniques
- creating and maintaining adequate and accurate calculations and design process records
- reporting and documenting results of investigations, application of principles and techniques, calculations, specifications, diagrams, CAD files, mock-ups or prototypes of designs.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- life-cycle design and sustainability implications of electrical component and system designs
- CM and ILS requirements
- design processes and techniques to investigate, synthesise and develop proposals, evaluate feasibility against design criteria, review and revise in consultation with stakeholders, model, mock-up and prototype

- systems thinking, problem solving and decision making, and continuous improvement methods
- WHS and regulatory requirements, codes of practice, standards, risk management and registration requirements
- professional and licensed technical assistance for engineering specialisations
- requirement for consultation and negotiation to establish design parameters and criteria
- procedures for planning, scheduling and coordination of design
- hardware requirements of typical aircraft electrical component and system applications
- engineering scientific principles and techniques required for aircraft electrical system design tasks
- design calculations techniques
- software for product planning and design, such as CAD layout, circuit design, system software and project management
- required documentation:
 - design brief and records of negotiation
 - planning and schedule
 - calculations and diagrams documentation for checking and design records
 - specifications and graphics required to define designs
 - risk analysis report
 - design process summary report
 - life-cycle and sustainability reports
 - CM and ILS documentation
- prototyping options, including mock-ups, simulation, physical and virtual modelling, and rapid prototyping.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - communicate, negotiate and review design brief with stakeholders

- determine or confirm scientific principles and design techniques, WHS and regulatory requirements, and design specification requirements
- evaluate multiple solutions
- investigate life-cycle design and sustainability, technical and professional assistance required
- plan, schedule and coordinate the design task
- select design components using design process and scientific principles
- integrate aircraft electrical hardware and components into aircraft electrical systems
- solve problems and make decisions with systems thinking for contingencies and constraints and continuous improvement
- define designs, specify and document and apply graphical techniques, modelling, mock-up or prototyping techniques
- create and maintain adequate and accurate calculations and design process records
- report and document results and processes.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

ME A727 Apply calculus in avionic engineering situations

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to avionic engineering tasks requiring the use of calculus to support avionic system and component circuit analysis and limited design, either manually or through use of an appropriate software package.

It is suitable for paraprofessionals and technologists required to perform circuit analysis in the design and modification of avionic systems and components, and in the development and support of test stations. It is suitable for those pursuing technologist careers and qualifications.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

MEM23004A Apply technical mathematics

Competency Field

Avionic engineering

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes. Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|----|--|-----|---|
| 1. | Apply differentiation techniques to avionic engineering applications | 1.1 | Solve avionic engineering problems using the rules of differentiation |
| | | 1.2 | Solve avionic engineering problems that are expressed in the form of differential equations |

		1.3	Solve avionic engineering problems that require the application of partial differentiation
2.	Apply integration techniques to avionic engineering applications	2.1	Obtain integrals of algebraic, trigonometric and exponential functions and evaluate definite integrals
		2.2	Solve avionic engineering problems using the rules of integration
3.	Apply fourier analysis and laplace transforms to avionic engineering applications	3.1	Apply fourier analysis and laplace transforms in the analysis and design of avionic circuits
4.	Communicate outcomes	4.1	Communicate outcome to relevant stakeholders by appropriate means
		4.2	Explain outcome to stakeholders as appropriate
		4.3	Check outcome has addressed problem

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

Avionic engineering applications include:

- Circuit analysis relating to avionic systems and system components, including but not limited to:
 - communications
 - radio navigation
 - inertial navigation
 - pulse
 - display
 - automatic flight control
 - flight management
 - engine management
- Circuit analysis relating to the design, modification and

- update of avionic component test stands
- Appropriate communication techniques include:**
- Reporting
 - Publication amendment
 - Revision of design data
 - Presentation
 - Verbal communication
 - Web-based
 - Electronic or hard copy
- Check outcome includes:**
- Ensuring that the result of the analysis does assist in the resolution of the problem

Unit Mapping Information

New unit of competency

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA727 Apply calculus in avionic engineering situations

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying and defining avionic circuit analysis problems
- collecting and analysing data through the application of calculus techniques
- reporting and presenting data and quantitative information
- communicating effectively with stakeholders on problem resolution.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- differential calculus:
 - differentiation from first principles
 - differentiation by rule
 - differentiating derivatives of trigonometric, logarithmic and exponential functions
 - Newton's method
 - differentiation application (turning points, intercepts, limits, symmetry, maxima and minima rates)
 - solving first and second order differential equations
 - solving problems involving partial differentiation with up to three independent variables
- integral calculus:
 - definite integrals
 - indefinite integrals
 - integration of trigonometric, algebraic and exponential functions
 - integration using partial fractions
 - integration using improper integrals
 - integration by parts
 - integration with the aid of tables
 - the calculation of areas and volumes
 - the determination of means and root mean square

- the application of double integrals to moments problems and application of double integrals in polar form
- complex numbers – manipulation of complex numbers and application of De Moivre's theorem
- electronic circuit analysis using fourier analysis and laplace transforms.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - identify appropriate calculus technique(s) for avionic engineering or related problems
 - apply the appropriate technique to the problem
 - perform circuit analysis using fourier analysis and laplace transforms
 - check answer has addressed problem
 - communicate the outcome of the analysis in an appropriate manner.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

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MEA729 Apply configuration management procedures in airworthiness engineering management

Modification History

Release 1 - New unit of competency

Application

This unit of competency applies to engineering or related projects or operations across all forms of manufacturing and engineering. It is suitable for people with system design, installation, commissioning and project or operational management responsibilities who are required to apply configuration management (CM) procedures during system design and/or during the life-cycle of a product. The procedures are used as the control mechanism during the application of the systems engineering design processes which may be used in the design of complex hardware and software products, both for initial design and then as an iterative process as the need for modifications are identified throughout the life-cycle of the product. The outputs of the CM process are configuration documentation that can be used for through-life management or for input of data to logistic management plans where integrated logistics support (ILS) is mandated as the through-life management system.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

- | | |
|--------|--|
| MEA135 | Use computers in aviation maintenance-related integrated logistic support activities |
| MEA138 | Perform aviation technical publication management activities |

Competency Field

Airworthiness engineering management

Unit Sector

Elements and Performance Criteria

Elements describe the Performance criteria describe the performance needed to

essential outcomes.		demonstrate achievement of the element.
1.	Plan CM activities	1.1 Identify the context and environment in which CM is to be applied
		1.2 Identify any contractual requirements and specifications for the application of CM procedures to through-life management of product configuration, including the relationship with logistics management systems, such as ILS
		1.3 Document the required CM activities
2.	Develop CM plan	2.1 Describe how CM is to be accomplished
		2.2 Specify how consistency between the product definition, configuration and the CM records is to be achieved and maintained throughout the applicable phases of the product's life-cycle
		2.3 Identify and specify performance indicators for assessing the effectiveness of the plan in terms of implementation and performance of the CM discipline
3.	Specify and set up CM documentation	3.1 Identify records required to effectively implement CM within the identified product context and environment, regulatory requirements and CM plan
		3.2 Select documentation media and develop documentation templates
		3.3 Specify a document version control system
		3.4 Determine and specify protocols for documentation safeguarding and access
4.	Establish and control CM baseline	4.1 Establish product CM baseline in relation to the systems engineering or other design process
		4.2 Revise CM baseline at applicable stages of product development, production and engineering changes in accordance with the CM plan
		4.3 Establish and review documentation baselines in line with the requirements of the CM plan and with changes in the product CM baseline
5.	Implement CM processes	5.1 Develop and deliver training to responsible individuals covering roles and responsibilities and

		the procedures for implementing CM processes as defined in the CM plan
	5.2	Measure performance against the performance indicators in the CM plan and assess measurements/trends to identify possible process improvements
6.	Perform configuration status accounting	6.1 Develop and populate a database with information relating to the configuration of products classified as configuration items
		6.2 Develop and promulgate procedures to update and validate the database whenever there is a configuration change throughout product life-cycle
		6.3 Disseminate data in accordance with the CM plan and standard enterprise procedures
7.	Participate in configuration audits	7.1 Participate in configuration audits where required by the applicable CM standard and the CM plan
		7.2 Initiate action to correct deficiencies identified during audits

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

CM context and environment include:

- The nature of the products, such as hardware and/or software, complete systems and system components or subsystems
- Whether or not CM must extend to subcontractors and/or vendors
- Specific CM value adding functions and level of emphasis
- Contractual CM requirements, including specification of a CM standard to be applied

Use of CM data in logistic management system activities includes:

- Airworthiness regulatory requirements
- Reliability and maintainability engineering
- Maintenance planning
- Life-cycle costing
- Spares support requirements
- Technical data and publications
- Support and test equipment identification
- Determining facilities requirements
- Determining personnel training requirements

CM plan includes:

- Brief description of system or top level configuration item (CI) and of the lower level CI's covered by the plan
- List of reference documents (specifications, standards, manuals, etc)
- CM organisation and responsibilities
- CM phasing and milestones
- Data management
- Configuration identification, including selection of CI's, baseline establishment, configuration identifiers for hardware and for software
- Interface management
- Performance indicators
- Configuration control procedures
- Configuration status accounting procedures
- Configuration audit procedures
- Subcontractor/vendor control procedures

Systems engineering interface refers to:

- Systems engineering processes result in the output of technical information that is controlled through the CM process. Through the service life of the product the CM process identifies the need for modifications and the systems engineering process is used to design and develop the modifications which then result in changes to the CM baseline and documentation which may then also feed into logistic support plan updates

CM standards and references include:

- EIA-649-A 2004 National Consensus Standard for Configuration Management
- GEIA Standard 836-2002 Configuration Management Data Exchange and Interoperability
- IEEE Standard 828-1998 IEEE Standard for Software Configuration Management Plans
- MIL-STD-973 Configuration Management
- STANAG 4159 NATO Materiel Configuration Management Policy and Procedures for Multinational Joint Projects
- STANAG 4427 Introduction of Allied Configuration

Management Publications

- IEEE Standard 1042-1987 IEEE Guide to Software Configuration Management
- MIL-HDBK-61A Configuration Management Guidance
- 10007 Quality management – Guidelines for configuration management
- GEIA-HB-649 Implementation Guide for Configuration Management
- EIA-836 Consensus Standard for Configuration Management Data Exchange and Interoperability
- ANSI/EIA-632-1998 Processes for Engineering a System
- AAP7001.053 Technical Airworthiness Management Manual
- Civil Aviation Safety Regulations (CASRs) and related documentation/publications

Airworthiness regulations are found in:

Unit Mapping Information

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA729 Apply configuration management procedures in airworthiness engineering management

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- identifying CM requirements for a product, including listing CIs
- identifying and complying with relevant airworthiness regulations relating to configuration control, documentation and publications
- applying CM processes to the data produced through systems engineering
- establishing CM baselines during product design and development
- developing a CM plan
- training organisation staff in CM plan implementation
- developing CM documentation and related access, version control and security protocols
- implementing and reviewing CM for a product
- developing and applying CM status accounting and maintaining baseline records
- participating in configuration audits and initiating action to resolve deficiencies
- inputting CM data to logistic support plans, where applicable.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the use and application of CM in through-life management of product configuration
- CM standards and procedures
- relationship between CM and systems engineering during initial design and production
- iteration of the CM and systems engineering interface throughout the product life-cycle during modification development and configuration baseline revision
- relationship between CM and logistic support requirements, such as providing data and updates for ILS plans throughout the product life cycle
- relationship between CM and airworthiness regulations regarding control of aircraft and aeronautical product configuration.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate can competently and consistently:
 - determine the scope of the CM task and identify items for CM (CIs)
 - compile CM documentation from systems engineering data
 - establish and review configuration baselines during product development and production
 - comply with relevant airworthiness regulations
 - develop CM plans
 - implement CM plans
 - review CM performance
 - establish and maintain CM status accounting databases and procedures
 - participate in CM audits and manage the remedy of deficiencies.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -
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MEA730 Apply systems engineering procedures to airworthiness engineering design project management

Modification History

Release 1 - New unit of competency

Application

Systems engineering procedures are applied in setting up management procedures for engineering design projects involving the design of complex systems that require the integration of subsystems and/or components by a multi-discipline engineering team. The management processes may relate to all design stages and may include the development of systems software. In the production and life-cycle management stages, systems engineering design stage output data may be used in the application of configuration management (CM) procedures (MEA729 Apply configuration management procedures in airworthiness engineering management) and/or to support the application of integrated logistic support (ILS) (MEA139 Perform aviation maintenance-related integrated logistic support management activities) where justified by system size and complexity or where required by contract.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

Pre-requisite Unit

- | | |
|--------|--|
| MEA135 | Use computers in aviation maintenance-related integrated logistic support activities |
| MEA137 | Write aviation maintenance technical publications |

Competency Field

Airworthiness engineering management

Unit Sector

Elements and Performance Criteria

Elements describe the essential Performance criteria describe the performance needed to

outcomes.	demonstrate achievement of the element.
1. Analyse and document system requirements	1.1 Identify and document customer or contractual system requirements and relevant regulatory requirements 1.2 Set up a systems engineering team and allocate responsibilities 1.3 Analyse system requirements and define functional requirements and design constraints
2. Perform functional analysis and allocation	2.1 Decompose system functions to lower-level functions applicable to system design 2.2 Allocate design constraints to all functional levels 2.3 Define and refine internal and external functional interfaces 2.4 Define, refine and integrate functional architecture 2.5 Review functional analysis outcomes against requirements and revise where necessary 2.6 Develop and document the functional baseline
3. Manage preliminary design activities	3.1 Coordinate the development of performance specifications for the system and components 3.2 Define alternatives for system concepts, components and system elements 3.3 Select preferred product and process solutions 3.4 Define and refine internal and external physical interfaces 3.5 Define and refine system software requirements 3.6 Develop and document the allocated baseline
4. Manage the detail design activities	4.1 Coordinate the development of item, process and material specifications 4.2 Coordinate the development of software specifications 4.3 Coordinate the development of engineering drawings and associated material/component/hardware lists

- | | | |
|---|-----|---|
| | 4.4 | Coordinate the development of item performance specifications |
| | 4.5 | Determine product review and design verification procedures |
| | 4.6 | Develop and document the product baseline |
| 5. Provide oversight of production and delivery | 5.1 | Apply product review and verification procedures and initiate action to remedy design or production deficiencies |
| | 5.2 | Ensure that all relevant regulatory requirements are being met |
| 6. Provide for life-cycle management of the system, components and software | 6.1 | Where there is a contractual requirement for application of CM, provide the technical data package and define the configuration items and baselines |
| | 6.2 | Where there is a contractual requirement for ILS, provide the technical data package and data required for the development of the relevant ILS plans |
| | 6.3 | Where there are no contractual requirements regarding life-cycle management, deliver the technical data package and develop procedures for the management of the configuration of the system, system components and software that meet relevant regulatory requirements |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for 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.

- Systems engineering process management:**
- The systems engineering process is a comprehensive process for the design and integration of complex systems that cover a range of engineering disciplines.

- The actual design work will be performed by appropriately qualified specialist engineers and the management process ensures that the design activities are coordinated and integrated into a system that meets specified performance requirements and complies with relevant airworthiness regulations
- System requirements analysis:**
- System requirements analysis involves inputs, such as customer needs and objectives, regulatory requirements and the technology base. It must clarify and define functional requirements and design constraints
- Functional analysis and allocation:**
- Functional analysis and allocation provides a greater understanding of what the system has to do and allocates overall system performance requirements to lower level subsystem and component functions. In so doing, it provides information essential to optimising physical solutions
- Baselines:**
- The functional, allocated and product baselines document a product at a specific stage of design definition. The functional baseline describes system level requirements, the allocated baseline describes design requirements for items below systems level and the product baseline describes the product physical detail
- Technical data packages include:**
- Engineering drawings and associated lists
 - Technical manuals
 - Manufacturing part programs
 - Verification provisions
 - Spares provisioning lists
 - Specifications developed for the system and system components
 - Specifications and standards from international and national bodies (government and non-government)
 - Relevant regulatory standards and requirements
- Reference materials include:**
- System Engineering Fundamentals, Dept of Defence Systems Management College
 - NASA/SP-2007-6105 Rev 1 NASA Systems Engineering Handbook
 - Project Documentation Document SPEC-0064 Rev A, ATST System Engineering Plan
 - 7th Annual Conference on Systems Engineering Research 2009 (CSER 2009), Systems Thinking or Systems Engineering
- Airworthiness regulations are found in:**
- AAP7001.053 Technical Airworthiness Management Manual
 - Civil Aviation Safety Regulations (CASRs) and related documentation/publications

Unit Mapping Information

New unit of competency

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA730 Apply systems engineering procedures to airworthiness engineering design project management

Modification History

Release 1 - New unit of competency

Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- setting up and managing procedures for systems analysis and control that comply with relevant airworthiness regulations
- setting up and managing a systems engineering team
- developing and implementing procedures for identification of systems engineering process inputs
- managing, and recording the outcomes of, requirements analysis
- managing and recording the outcomes of functional analysis and allocation and apply the requirements loop process
- developing and documenting the functional baseline
- managing the development of the system specification and preliminary design
- developing and documenting the allocated baseline
- applying the design loop process
- managing the detail design process and using outputs to develop a technical data package that meets airworthiness regulatory requirements
- developing and documenting the product baseline
- maintaining oversight of the production and delivery phase
- providing process outputs for the establishment of CM procedures or ILS plans
- determining requirements for life-cycle management where CM or ILS is not required and setting up and documenting a life-cycle management system that complies with relevant airworthiness regulations.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- the systems engineering process and management procedures, including relevant airworthiness regulations
- how to set up and manage the activities of a systems engineering design team
- development of specifications and standards

- identification of applicable published specifications and standards
- how to set up and manage a systems analysis and control database
- how to use process outputs to set up CM and ILS systems for through-life management
- how to develop and document an applicable life-cycle management system where CM or ILS is not prescribed or is inappropriate
- ethical considerations in systems engineering.

Assessment Conditions

- 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 a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- 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 managing the application of the systems engineering process.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units	

Prerequisite units	

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.
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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 <i>oxy acetylene</i>	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.

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

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	<p>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.</p> <p>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.</p>
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	
<p>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.</p>	
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	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Fabrication
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MEM05006C Perform brazing and or silver soldering

Modification History

Corrections to descriptor and range to clarify inclusion of 'braze welding'.

Unit Descriptor

Unit descriptor	This unit covers performing brazing (including braze welding) and silver soldering. It includes the preparation of materials and equipment and the inspection of the completed work.
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Application of the Unit

Application of the unit	<p>This unit applies to silver soldering and brazing using all grades of silver solder and braze. It also includes soldering of copper and refrigeration work. Work includes the preparation of materials and equipment and the inspection of the completed work.</p> <p>Work is undertaken in a production or maintenance environment using predetermined standards of quality, safety and work procedures.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Prerequisite units	

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare materials and equipment	<p>1.1. Job requirements are determined from specifications and/ or instructions.</p> <p>1.2. Materials are correctly prepared using appropriate tools and techniques.</p> <p>1.3. Materials are correctly assembled/aligned to meet specifications as required.</p> <p>1.4. Distortion prevention measures are identified and appropriate action is taken as required.</p> <p>1.5. Heating equipment is assembled and set up safely and correctly in accordance with standard operating procedures.</p> <p>1.6. Correct and appropriate consumables are selected and prepared.</p> <p>1.7. Test run is undertaken and verified as required.</p>
2. Braze and/or silver	2.1. The correct process is selected to meet specifications.

ELEMENT	PERFORMANCE CRITERIA
solder	2.2. Materials are preheated as required. 2.3. Consumables are applied using correct techniques. 2.4. Jointing material is applied correctly and in appropriate quantities to meet job/specifications. 2.5. Material temperature is annealed using correct and appropriate techniques.
3. Inspect joints	3.1. Excess jointing materials are removed using correct and appropriate techniques. 3.2. Inspection of joints is undertaken to standard operating procedures. 3.3. Inspection results are reported/recorded using standard operating procedures 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:

- preparing materials
- performing brazing, braze welding, silver soldering
- undertaking visual inspection
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures
- following oral instructions

Required knowledge

Look for evidence that confirms knowledge of:

- the reasons for selecting specific methods of assembly/alignment
- the procedures for minimising distortion of the materials being brazed/braze welded/silver soldered
- the procedures for assembling and setting up the specific heating equipment
- the reasons for selecting specific heating equipment
- the reasons for selecting specific consumables
- conducting test runs

REQUIRED SKILLS AND KNOWLEDGE

- typical applications of brazing/braze welding and silver soldering processes
- the procedures and precautions for preheating the materials to be joined
- the effects of the use of inappropriate techniques on the performance of the jointed materials
- the effect of inappropriate quantities of jointing material on the performance of the jointed materials
- the procedures for normalising the temperature of jointed materials
- the consequences of using inappropriate techniques to normalise the temperature of the joint
- the procedures for removing excess jointing material
- the procedures for inspecting brazed/braze welded/silver soldered joints
- use and application of personal protective equipment for silver soldering and brazing/braze welding
- 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 brazing (including braze welding) and silver soldering.

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

EVIDENCE GUIDE	
	<p>candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with brazing (including braze welding) and/or silver soldering or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Materials	Ferrous and non-ferrous
Heating	Oxy acetylene and fuel gas, cylinders, connections, hoses, tips and nozzles
Consumables	Fluxes (resin or powder), all types of silver solder and brazing grades, etc.

RANGE STATEMENT

Process	Brazing, braze welding and silver soldering
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Unit Sector(s)

Unit sector	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Prerequisite units	

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.
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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.

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

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.

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

Unit Sector(s)

Unit sector	
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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).
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units	

Prerequisite units	

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.
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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.

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).

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	<p>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.</p> <p>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.</p>
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

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	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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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.
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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.
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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

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

EVIDENCE GUIDE	
competency in this unit	<p>this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p>
Method of assessment	<p>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.</p> <p>A single assessment event is not appropriate. On the job assessment should be included as part of the assessment</p>

EVIDENCE GUIDE	
	<p>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.</p> <p>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.</p> <p>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.</p>
Guidance information for assessment	<p>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.</p> <p>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.</p>

Range Statement

RANGE STATEMENT
<p>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.</p>

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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • porosity • slag inclusions • discontinuities • lack of penetration • undercut

Unit Sector(s)

Unit sector	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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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
	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.
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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

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

EVIDENCE GUIDE	
	<p>unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>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.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Welding equipment	AC or DC welding machines, settings, electrodes and related equipment
Materials	Materials used would include low carbon, cast

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	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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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.
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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.
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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

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.

EVIDENCE GUIDE	
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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:</p> <ul style="list-style-type: none"> • 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.
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>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.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE	
	<p>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.</p> <p>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.</p> <p>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.</p>
Guidance information for assessment	<p>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.</p> <p>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.</p>

Range Statement

RANGE STATEMENT
<p>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</p>

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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>Weld quality would typically conform to Australian Standard 1554 Structural Purpose, Bureau Det Norse Verticas or equivalent.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

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.
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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.
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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
<p>This section describes the skills and knowledge required for this unit.</p>
<p>Required skills</p>
<p>Look for evidence that confirms skills in:</p> <ul style="list-style-type: none"> • 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

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

EVIDENCE GUIDE	
	<p>unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>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.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
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

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	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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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.
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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.
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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

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

EVIDENCE GUIDE	
	be awarded until all prerequisites have been satisfied.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p>
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

EVIDENCE GUIDE	
	<p>jobs and specifications.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Guidance information for assessment	<p>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.</p> <p>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.</p>

Range Statement

RANGE STATEMENT
<p>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</p>

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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • pre-heating • setting up of jigs, fixtures and clamps
Rectified	Rectified may include: <ul style="list-style-type: none"> • oxy acetylene and air arc equipment • grinding devices
Defects	Defects may include: <ul style="list-style-type: none"> • 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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM05007C	Perform manual heating and thermal cutting

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.
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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.
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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:

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.

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

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	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>This unit covers the competencies required for welding quality that would meet the Australian Standard 1554 Special Purpose, appropriate industrial standards, or equivalent outcomes.</p> <p>Where welds comply with one of the certificates covered by Australian Standard 1796, then Unit MEM05026C (Apply welding principles) should also be selected.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 6</p>
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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.
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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.
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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:

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

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	<p>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.</p> <p>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.</p>
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 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	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>This unit must be assessed in combination with one of the units satisfying the Australian Standard 1796 Certificates 1-9 and these units include:</p> <ul style="list-style-type: none"> • 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. <p>This unit has been developed for Engineering Tradespersons - Fabrication in either apprenticeship or post trade training and the recognition of trade level</p>
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	<p>knowledge of welding principles.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>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.</p>
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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

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 standards, 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

EVIDENCE GUIDE	
	<p>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.</p> <p>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.</p>
Method of assessment	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Guidance information for assessment	<p>This unit must be assessed in combination with one of the units satisfying the Australian Standard 1796 Certificate 1-9 and these units include:</p> <ul style="list-style-type: none"> • 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

EVIDENCE GUIDE

	<ul style="list-style-type: none"> • 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. <p>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.</p> <p>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.</p>
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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.

Statutory and safety requirements	Statutory and safety requirements as required by AS 1796 welding codes
Welding	<p>Welding to AS 1796 using any of the following processes:</p> <ul style="list-style-type: none"> • flux core arc welding • gas metal arc welding • gas tungsten arc welding • manual metal arc welding

Unit Sector(s)

Unit sector	
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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).
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>This unit, in conjunction with Unit MEM05026C (Apply welding principles), may satisfy the requirements of AS 1796 Certificate 8G.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 6</p>
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Licensing/Regulatory Information

Not Applicable

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.
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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
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	with the evidence guide.
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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
<p>Look for evidence that confirms skills in:</p> <ul style="list-style-type: none"> • 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

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

EVIDENCE GUIDE	
	<p>should not disadvantage the candidate.</p> <p>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.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
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

RANGE STATEMENT	
	aluminium materials, etc. on plate, pipe and rolled steel sections

Unit Sector(s)

Unit sector	
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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).
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 6</p>
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Licensing/Regulatory Information

Not Applicable

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.
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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
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	with the evidence guide.
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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
<p>Look for evidence that confirms skills in:</p> <ul style="list-style-type: none"> • 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, specifications and standard operating procedures. May include drawings

REQUIRED SKILLS AND KNOWLEDGE

- 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 workplace situations. The competencies covered by this unit would be demonstrated by an individual working

EVIDENCE GUIDE	
	<p>alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>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.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Routine maintenance	<p>Ensuring hand piece, gas shroud, flow meter etc. are in serviceable condition</p>
Prepared	<p>Flame cut and ground or machined, preheating, setting up of jigs, fixtures, clamps, etc.</p>

RANGE STATEMENT	
Materials	Carbon/manganese steel, low alloy steel and aluminium materials, etc. on plate, pipe and rolled steel sections

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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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).
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 6</p>
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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.
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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

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

EVIDENCE GUIDE	
assessment	<p>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.</p> <p>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.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT
<p>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.</p>

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	
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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).
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units	

Prerequisite units	

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.
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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.

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).

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	<p>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.</p> <p>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.</p>
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

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	
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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).
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		

Prerequisite units	

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.
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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.

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

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	<p>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.</p> <p>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.</p>
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.

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	
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Co-requisite units

Co-requisite units	

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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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.
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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

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

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	<p>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.</p> <p>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.</p>
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	
<p>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.</p>	
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	<ul style="list-style-type: none"> • Fusion: <ul style="list-style-type: none"> • electric arc welding • gas (oxy-fuel) welding • thermit welding • Pressure welding processes: <ul style="list-style-type: none"> • resistance welding • fire or forge welding • friction welding • explosive welding • Low temperature processes: <ul style="list-style-type: none"> • soldering • brazing • Other: <ul style="list-style-type: none"> • 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

RANGE STATEMENT

Safety requirements	<ul style="list-style-type: none"> • 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
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Unit Sector(s)

Unit sector	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>Band: A Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Access and interpret OH&S information	<p>1.1.OH&S information is obtained and interpreted.</p> <p>1.2.Relevant OH&S legislation is identified.</p> <p>1.3.Work related safety information is obtained and interpreted.</p>
2. Identify risks associated with welding	<p>2.1.Pollutants formed by welding processes are identified.</p> <p>2.2.Occupational diseases and injuries which may be associated with welding are identified.</p> <p>2.3.Factors associated with increased risk are identified.</p> <p>2.4.Exposure levels for pollutants are identified.</p> <p>2.5.Risks and potential health effects associated with specific metals are identified.</p> <p>2.6.Risks and potential health effects associated with gases in welding are identified.</p> <p>2.7.Other hazards of welding are identified.</p>
3. Reduce risks associated with welding	<p>3.1.Manual handling techniques are used.</p> <p>3.2.Personal protective equipment is used correctly.</p> <p>3.3.Procedures to control hazards are implemented.</p> <p>3.4.Workplace safety procedures are implemented.</p> <p>3.5.Workplace safety non-compliances are reported in accordance with workplace procedures.</p>

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

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	<p>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.</p> <p>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.</p>
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

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

RANGE STATEMENT	
Occupational diseases and injuries	<ul style="list-style-type: none"> • Eye injuries • Skin damage • Respiratory irritations • Chronic effects • Allergies
Factors	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Time Weighted Average • Short Term Exposure Limit (STEL) • Maximum Allowable Concentration (MAC) or Threshold Limit Value - Ceiling (TLV-C) • Skin Notation
Specific metals	<ul style="list-style-type: none"> • Aluminium • Antimony • Arsenic • Beryllium • Boron • Cadmium • Chromium • Copper • Cobalt • Iron • Lead • Lithium • Magnesium • Manganese • Mercury • Molybdenum • Nickel • Platinum • Selenium

RANGE STATEMENT	
	<ul style="list-style-type: none"> • Silver • Thorium • Tin • Titanium • Tungsten • Vanadium • Zinc • Zirconium
Gases	<ul style="list-style-type: none"> • Acetylene • Argon • Carbon dioxide • Carbon monoxide • Helium • Nitrogen oxides • Ozone • Phosgene • Phosphine • Stibine
Other hazards	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Housekeeping practices • Lifting weight limits

RANGE STATEMENT	
	<ul style="list-style-type: none"> • Appropriate storage • Use of lifting devices • Appropriate training • Hazardous materials storage standards and procedures
Personal protective equipment	<ul style="list-style-type: none"> • Respirators • Ear muffs • Protective clothing • Gloves • Boots • Helmets • Eye protection • Face shields
Procedures to control hazards	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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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MEM06003C Carry out heat treatment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers carrying out heat treatment of materials using a variety of equipment.
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Application of the Unit

Application of the unit	<p>This unit applies to the heat treatment of ferrous and non-ferrous metals using a variety of equipment.</p> <p>Examples of applications include cast metal products, machine tooling, and forged and machined components.</p> <p>Simple heat treatment applications like annealing and/or heat/quench processes undertaken as incidental to trade work (e.g. toolmaking) are covered by Unit MEM06007B (Perform basic incidental heat/quenching, tempering and annealing).</p> <p>Band: A</p> <p>Unit Weight: 6</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units	

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine requirements of job	1.1. Job requirements are determined from engineering drawings, job sheet, or verbal instructions from metallurgist or supervisor.
2. Select heat treatment equipment	2.1. Appropriate equipment is selected for the required heat treatment.
3. Set up equipment	3.1. Equipment is set up according to standard operating procedures and manufacturers' instructions.
4. Work safely with hot metals	4.1. Safety clothing and personal protective equipment is used correctly according to standard operating procedures. 4.2. Emergency procedures are demonstrated according to approved safety instructions. 4.3. Safety signs and symbols are identified and understood. 4.4. Equipment is used according to specifications and

ELEMENT	PERFORMANCE CRITERIA
	standard operating procedures.
5. Heat treat material	5.1. Material is treated to achieve required result and may include preparation processes. 5.2. Material is piece or batch loaded and unloaded using equipment appropriate to the situation, according to standard operating procedures. 5.3. Correct temperature is maintained according to standard operating procedures.
6. Identify hazardous conditions	6.1. Hazards are identified and hazard control measures are implemented to maintain a safe work environment.

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 and operating heat treatment equipment
- applying heat treatment
- safely loading furnace(s)

Required knowledge

Look for evidence that confirms knowledge of:

- work specifications
- material characteristics
- heat treatment applications, equipment and processes
- emergency procedures
- material preparation, quenching, preheating requirements
- material condition during heat treating process
- batch and/or piece loading of furnaces
- safe loading of furnaces
- hazards and control measures associated with heat treatment, including housekeeping
- use and application of personal protective equipment

REQUIRED SKILLS AND KNOWLEDGE

- | |
|--|
| <ul style="list-style-type: none"> • 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 work safely with hot metals to carry out heat treatment of materials.

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 heat treatment 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

EVIDENCE GUIDE	
	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	
<p>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.</p>	
Equipment	Gas, electric, oil fired furnaces, vacuum furnace, induction heating, kilns, heated baths, salt baths, specialised tongs/tools and lifting equipment
Material	Plain carbon steels, alloy steels, non-ferrous
Preparation processes	Coatings and packings; preheating; soaking; quenching; tempering; annealing; normalising; carburizing; sintering

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Forging
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MEM07001B Perform operational maintenance of machines/equipment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers carrying out programmed safety and maintenance checks on machines/equipment.
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Application of the Unit

Application of the unit	<p>This unit mainly applies in a manufacturing setting, where routine programmed operational maintenance to machines/equipment is required. It is not intended to be used where higher level maintenance activities are performed.</p> <p>Machines/equipment range includes manual, semi-automatic and automatic machines of a stand-alone continuous production or process nature.</p> <p>This unit should not be selected when any of the following are selected: Unit MEM18055B (Dismantle, replace and assemble engineering components), Unit MEM18006C (Repair and fit engineering components), Unit MEM07005C (Perform general machining).</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Undertake programmed safety and maintenance checks	1.1. Checks are undertaken safely and to prescribed procedure. 1.2. Status/report is recorded on proforma or reported orally.
2. Undertake programmed maintenance	2.1. Removal/replacement of consumable components is undertaken to prescribed procedure and instructions are followed. 2.2. Fluids and lubricants are replaced and/or topped up to prescribed schedule.

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:

- undertaking programmed safety and maintenance checks
- undertaking programmed operational maintenance
- entering routine and familiar information onto proformas and standard workplace forms
- following routine information on written procedures
- following oral instructions
- orally reporting routine information

Required knowledge

Look for evidence that confirms knowledge of:

- programmed maintenance and safety check procedures for the specified machine/equipment
- recording/reporting requirements
- safe work practices and procedures
- hazards and control measures associated with operational maintenance of machines/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 perform operational maintenance of machines/equipment. 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

EVIDENCE GUIDE	
	knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operational maintenance of machines/equipment or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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

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.

Machines/equipment	Manual, semi-automatic and automatic machines of a stand-alone continuous production or process nature
Checks	Programmed safety and maintenance checks Adjustments of a limited nature including safety guards, stops, wear pads and tool holders, nipping up glands and adjustment of scrapers and aprons
Consumable components	Air filters, oil wipers, grease containers, tool tips, indicator globes, fluids and lubricants, guides and limit switch actuators

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Machine and process operations
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MEM07002B Perform precision shaping/planing/slotting operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing precision shaping/planing/slotting operations.
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Application of the Unit

Application of the unit	<p>This unit applies to a range of one or more of precision shaping, planing or slotting operations where achievement of the specified tolerance and finish is mandatory.</p> <p>Work is performed to drawings or sketches, specifications and instructions as appropriate.</p> <p>Precision measuring instruments, standard engineering materials and cutting tools are used.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining

Prerequisite units		
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical measurement
	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.
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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 operations determined and tools selected to produce component to specification. 2.2. Cutting parameters are determined.
3. Perform precision shaping operations	3.1. Precision shaping operations are carried out including precision flat surfaces, shoulders, slots, keyways, angles and dovetails.

ELEMENT	PERFORMANCE CRITERIA
4. Perform precision planing operations	4.1.Precision planing operations are carried out including horizontal and vertical surfaces and angles.
5. Perform precision slotting operations	5.1.Precision slotting operations are carried out including feathered and tapered keyways, slotting internal cavities, dovetails, slotting circular surfaces and internal splines.
6. Check component for conformance to specification	6.1.Component is 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

Look for evidence that confirms skills in:

- preparing an operational work plan
- performing precision shaping operations:
 - flat surfaces
 - shoulders
 - slots
 - keyways
 - angles
 - dovetails
- performing precision planing operations on:
 - horizontal and vertical surfaces
- performing precision slotting operations:
 - feathered keyways
 - tapered keyways
 - slotting internal cavities
 - dovetails
 - slotting circular surfaces
 - slotting internal splines
- checking for conformance to specifications

REQUIRED SKILLS AND KNOWLEDGE

- using precision measurement equipment
- planning and sequencing operations
- reading and interpreting information on written job instructions, specifications, charts, lists, drawings and other applicable reference documents
- checking and clarifying task related information
- measuring components to specified tolerances
- performing calculations for determining cutting parameters and checking tolerances
- undertaking numerical operations within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- reasons for selecting the chosen sequence of operations
- procedures for setting up the work piece
- tool type and geometry to achieve the required specifications on different materials
- techniques and procedures for machining the following:
 - flat surfaces
 - shoulders
 - slots
 - keyways
 - angles
 - dovetails
- planing techniques and procedures for machining:
 - horizontal and vertical surfaces
- slotting techniques and procedures for machining:
 - feathered keyways
 - tapered keyways
 - slotting internal cavities
 - dovetails
 - slotting circular surfaces
 - slotting internal splines
- appropriate techniques, tools and equipment to measure machined components
- hazards, control measures and housekeeping associated with precision shaping/planing/slotting operations
- use and application of personal protective equipment
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to perform precision shaping/planing/slotting operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing precision shaping/planing/slotting operations or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE

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.

Tools

Cutting tools, tool holders

Cutting parameters

Feeds, speeds, depth of cut, length of cut etc.

Precision operations

The use of dedicated precision measuring instruments

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Machine and process operations
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>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.</p> <p>Machining is undertaken on one or more of a range of standard machine tools. Machines are not computer numerical controlled (CNC) machines.</p>
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	<p>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.</p> <p>Drilling operations in this unit exclude those covered by MEM18002B Use power tools/hand held operations.</p> <p>Where substantial marking out is required, MEM12006C Mark off/out (general engineering) should be considered.</p> <p>Where precision measurement is required, MEM12003B Perform precision mechanical measurement should also be considered.</p> <p>For set-up and operation of electro-discharge (EDM) machines, refer to MEM07014B Perform electro-discharge (EDM) machining operations.</p> <p>Band: A</p> <p>Unit Weight: 8</p>
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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

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.
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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

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

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

EVIDENCE GUIDE	
	<p>workplace.</p> <p>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.</p>
Method of assessment	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Guidance information for assessment	<p>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.</p> <p>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.</p>

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Operations	<p>Operations may include:</p> <ul style="list-style-type: none"> • parallel cutting • slotting • planing • drilling • knurling • cutting flats • non-precision surface grinding operations
Materials	Materials may include ferrous and non-ferrous
Tools	<p>Tools may include:</p> <ul style="list-style-type: none"> • cutting tools and accessories • measuring devices
Marking out techniques	Marking out techniques may include basic marking out techniques using calipers, steel rules, dividers and scribes
Machining parameters	<p>Machining parameters may include:</p> <ul style="list-style-type: none"> • speeds • feeds • stops • coolant and cutting lubricants
Machines	<p>Machines may include:</p> <ul style="list-style-type: none"> • lathes • mills • planers • shapers • radial arm drills • slotters

RANGE STATEMENT

	<ul style="list-style-type: none"> • surface grinder
Maintenance and adjustments	Maintenance and adjustments may include: <ul style="list-style-type: none"> • slide and collar adjustment • cleaning and lubrication

Unit Sector(s)

Unit sector	
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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	<p>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.</p>
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>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.</p> <p>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</p>
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	<p>Machining'.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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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.
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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.
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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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> sequence of operations to achieve the job requirements

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

EVIDENCE GUIDE	
	<p>and responsibility for own work</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p>
Method of assessment	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Guidance information for assessment	<p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated</p>

EVIDENCE GUIDE

	<p>with lathe operations or other units requiring the exercise of the skills and knowledge covered by this unit.</p> <p>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.</p>
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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.

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

RANGE STATEMENT	
	<ul style="list-style-type: none"> • changing gears and speeds • use of lead screw • calculations
Accessories	<p>Accessories may include:</p> <ul style="list-style-type: none"> • three and four jaw chucks • centres • face plate • steadies • cross slide • tailstock
Turning operations	<p>Turning operations may include:</p> <ul style="list-style-type: none"> • 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	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>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.</p> <p>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'.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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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.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Observe safety	1.1. Correct safety procedures are observed and

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

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.

EVIDENCE GUIDE	
	<p>procedures for scrapping or reworking of components not milled to specification.</p>
Context of and specific resources for assessment	<p>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.</p> <p>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.</p>
Method of assessment	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Guidance information for assessment	<p>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.</p>

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.
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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.

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

Unit Sector(s)

Unit sector	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>Work is performed to established processes, practices and to drawings, sketches, specifications and instructions as appropriate.</p> <p>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.</p> <p>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'.</p> <p>Where precision mechanical measurement is required, MEM12003B Perform precision mechanical measurement should also be considered.</p>
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	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.
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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.
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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: <ul style="list-style-type: none"> • 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

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

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	<p>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.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p>
Method of assessment	<p>Typically, persons engaged in Engineering Tradesperson - Mechanical work are required to apply their grinding</p>

EVIDENCE GUIDE	
	<p>operations skills and techniques across a range of jobs and specifications.</p> <p>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.</p> <p>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.</p> <p>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.</p>
Guidance information for assessment	<p>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.</p> <p>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.</p>

Range Statement

RANGE STATEMENT
<p>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</p>

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: <ul style="list-style-type: none"> • dimensions and tolerances • geometry and tolerances • surface finish
Holding devices	Holding devices may include: <ul style="list-style-type: none"> • vices • clamps • magnetic chucks • face plates • collets • 3/4 jaw chuck
Wheels	Wheels may include: <ul style="list-style-type: none"> • 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	
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Co-requisite units

Co-requisite units	

Co-requisite units		

Competency field

Competency field	Machine and process operations
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MEM07009B Perform precision jig boring operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing precision jig boring operations using a range of jig boring and milling machines.
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Application of the Unit

Application of the unit	<p>This unit applies to operations where a range of jig boring and milling machines, tools and accessories are used to achieve a high level of precision in finished products.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM07007C	Perform milling operations
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical measurement

Prerequisite units		
	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.
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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 are worn.
2. Determine job requirements	2.1. Drawings are interpreted and sequence of operations is determined.
3. Select appropriate tools and accessories	3.1. Tools and accessories are selected in accordance with standard operating procedures to meet job specifications.
4. Mount job	4.1. Job is set up using instruments such as dial test indicators and digital read out equipment.
5. Perform jig boring	5.1. Holes are bored relative to coordinate position and to specification. 5.2. Rotary or tilting rotary table is used as required.

ELEMENT	PERFORMANCE CRITERIA
6. Check components for conformance to specification	6.1.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

Look for evidence that confirms skills in:

- reading, interpreting and following information on written job instructions, specifications, procedures, charts, lists, drawings and other applicable reference documents
- preparing operational work plan
- planning and sequencing operations
- selecting tools and accessories
- checking for conformance to specifications
- using precision measurement equipment
- checking and clarifying task related information
- performing numerical operations and calculations within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- reasons for selecting the chosen sequence of operations
- the application of rotary and tilting rotary tables to jig boring operations
- checks for conformance to specifications
- appropriate techniques, tools and equipment to measure machined components
- hazards and control measures associated with jig boring operations, including housekeeping
- use and application of personal protective equipment
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to perform precision jig boring operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing precision jig boring operations or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE

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.

Tools and accessories

Cutting tools, tool attachments, charts and nomograms, rotary or tilting rotary table etc.

Appropriate techniques

Measuring techniques, comparison methods

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Machine and process operations
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MEM07010B Perform tool and cutter grinding operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing a range of tool and cutter grinding operations.
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Application of the Unit

Application of the unit	<p>This unit applies to the use of a range of precision measuring instruments and standard engineering materials in performing tool and cutter grinding operations. Work is performed to drawings or sketches, specifications and instructions as appropriate. Work is carried out autonomously to predetermined standards of quality and safety.</p> <p>General off hand grinding is covered by Unit MEM18002B (Use power tools/hand held operations).</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining

Prerequisite units		
	MEM07008D	Perform grinding operations
	MEM09002B	Interpret technical drawing
	MEM12003B	Perform precision mechanical measurement
	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Observe safety precautions	1.1. Machine guards, coolant and dust extraction devices are checked. 1.2. Correct safety procedures are observed, and protective clothing and safety glasses are worn.
2. Determine job requirements	2.1. Drawings are interpreted and sequence of operations is determined.
3. Select appropriate	3.1. Tool and cutter grinding wheels are selected, based

ELEMENT	PERFORMANCE CRITERIA
tool and cutter grinding wheels and accessories	on knowledge of grinding wheel structure, and are balanced and dressed. Accessories are selected to facilitate production to specification.
4. Perform tool and cutter grinding	<p>4.1. Universal tool and cutter grinding machines are operated to sharpen and shape the full range of tools and cutters including side and face cutters, end mill, form relieved milling cutters, flat, vee and circular form tools and hobs, slitting saws, and drills.</p> <p>4.2. Parallel internal and/or external grinding is carried out.</p> <p>4.3. Internal and/or external taper grinding is carried out to drawing specifications.</p>
5. Check components for conformance to specification	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

Look for evidence that confirms skills in:

- reading, interpreting and following information on written job instructions, specifications, charts, lists, drawings and other applicable reference documents
- checking and clarifying task related information
- preparing operational work plan
- planning and sequencing operations
- performing numerical operations and calculations within the scope of this unit
- performing safety checks of equipment
- selecting tool and cutter grinding accessories
- balancing/dressing grinding wheels
- sharpening/shaping tools and cutters
- checking components for conformance with specifications
- using precision measurement equipment within the scope of this unit

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms knowledge of:

- reasons for selecting the chosen sequence of operations
- function of coolant and dust extraction devices
- criteria for grinding wheel selection:
 - grain size of abrasive particles
 - grade or strength of bond
 - bond material
- grinding wheel dressing procedures and wheel dressing tools
- source(s) of data on tool geometry for the full range of tools and cutters, including the terminology used to describe the tool geometry
- procedures to be followed when parallel grinding on a tool and cutter grinder
- procedures to be followed when grinding tapers on a tool and cutter grinder
- tools, techniques and equipment used to check ground components for conformance with the following specifications:
 - dimensions and tolerances
 - geometry and tolerances
 - surface finish
- hazards and control measures associated with tool and cutter grinding, 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 tool and cutter 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

EVIDENCE GUIDE	
	in new and different situations and contexts.
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing tool and cutter grinding operations or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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
<p>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</p>

RANGE STATEMENT

situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Tool and cutter grinding wheels	Wheel selection criteria includes shape and grit/bond composition
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Unit Sector(s)

Unit sector	
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Co-requisite units

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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM07007C	Perform milling operations
	MEM09002B	Interpret technical drawing

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.
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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.
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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.

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

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.

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.

Unit Sector(s)

Unit sector	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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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

Prerequisite units		
		measurement
	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.
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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.
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

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

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>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.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>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.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE

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.

Grinding wheels

Wheel selection criteria includes shape and grit/bond composition

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Machine and process operations
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MEM07013B Perform machining operations using horizontal and/or vertical boring machines

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing horizontal/vertical boring operations.
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Application of the Unit

Application of the unit	This unit applies to a range of boring operations, using precision measuring instruments and standard engineering materials and cutting tools. 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.
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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.
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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 are worn.
2. Determine job requirements	2.1. Drawings are interpreted, sequence of operations is determined and tools are selected to produce component to specification using International Standard Organisation or standard operating procedures. 2.2. Cutting parameters are determined.
3. Perform boring operations	3.1. Horizontal and vertical boring operations are carried out including parallel line and taper boring, facing, turning, drilling and reaming to drawing specifications.
4. Check component for conformance to specification	4.1. 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

Look for evidence that confirms skills in:

- reading, interpreting and following information on written job instructions, specifications, quality and standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task-related information
- preparing an operational work plan
- selecting, mounting and positioning cutting tools
- calculating and selecting cutting parameters, including speeds and feeds
- performing horizontal and/or vertical boring operations

Required knowledge

Look for evidence that confirms knowledge of:

- reasons for selecting the chosen sequence of operations
- geometry for cutting tools for a range of materials
- calculations for determining cutting parameters and checking tolerances within the scope of this unit
- consequences of varying the speeds and feeds from the optimum rates
- procedures and techniques for carrying out horizontal and vertical boring operations
- appropriate techniques, tools and equipment to measure components
- hazards and control measures associated with horizontal and/or vertical boring, 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.

EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform machining operations using horizontal and/or vertical boring 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	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the performance of machining operations using horizontal and/or vertical boring machines or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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	
<p>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.</p>	
Horizontal boring machines	Table type, floor type
Vertical boring machines	Double column, single column

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations
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MEM07015B Set computer controlled machines/processes

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers mounting work holding fixtures/devices/tools, conducting pre-start checks, setting numerical and computer controlled machines, instructing the operator and replacing worn or damaged tooling.
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Application of the Unit

Application of the unit	<p>The unit applies to the setting of any computer controlled machines/processes. Applications may include NC/CNC machines and industrial robots.</p> <p>Work is performed to established processes, practices, specifications and instructions as appropriate. Technical difficulties are resolved in consultation with appropriate technical advisers.</p> <p>For setting non-computer controlled machines or processes, refer to Unit MEM07003B (Perform machine setting [routine]).</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machine/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM07024B	Operate and monitor machine/process
Path 2	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.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Obtain job instructions	1.1. Job sheets or equivalent instructions are understood and correctly followed.
2. Mount work holding fixtures/devices/tools	2.1. Machine is prepared to accept work holding fixtures/devices/tools. 2.2. Preset tooling is mounted as required into machine/equipment. 2.3. Work holding fixtures/devices are set on machine as required using standard operating procedures. 2.4. Tool offset or datum settings are identified/verified against job sheet using standard operating procedures. 2.5. Program is loaded, selected and verified in accordance with job instructions.
3. Conduct pre-start checks	3.1. Pre-start checks are undertaken to standard operating procedures. 3.2. Correct safety procedures are observed and all safety equipment is checked for correct operation.
4. Set machine	4.1. Machine is set/adjusted to meet operational requirements and specifications. 4.2. Production samples are checked for compliance with specifications using standard operating procedures.
5. Instruct machine operator	5.1. Operator is instructed, if necessary, ensuring that all safety procedures and devices are in place.
6. Replace worn/damaged tooling	6.1. Where appropriate, preset tools are replaced, tool offsets are adjusted or other corrective action is taken 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:

REQUIRED SKILLS AND KNOWLEDGE

- 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
- mounting work holding fixtures/devices/tooling
- mounting preset tooling
- verifying tool offsets and/or datum settings against job sheets or instructions
- loading and verifying programs
- conducting pre-start checks
- following safety procedures
- checking safety features and safety equipment for correct operation
- performing numerical operations and calculations/formulae within the scope of this unit
- setting and adjusting machines
- measuring and verifying first-off samples
- instructing machine operators on the sequence of operations
- identifying worn or damaged tooling and taking appropriate corrective action

Required knowledge

Look for evidence that confirms knowledge of:

- work holding fixtures/devices/tools and preset tooling for different machines/processes
- procedures for mounting work holding fixtures/devices/tools
- location of work holding fixtures/devices/tools relative to the machine datum or zero
- reasons for establishing tool offsets
- the purpose of datum settings
- the source(s) of information on tool offsets and datum settings
- procedures to locate and load programs
- procedures for verifying loaded programs
- pre-start checks
- safety features of the machine/process
- the purpose and function of safety features and/or safety equipment
- machine/process setting procedures
- machine operating procedures
- adjustments that can be made to the machine/process
- the effect of adjustments on machine and operational specifications
- product or part specifications in relation to the machining process
- measuring devices for checking parts or products
- examples of worn or damaged tooling

REQUIRED SKILLS AND KNOWLEDGE

- the effects of worn or damaged tooling
- the corrective action for worn or damaged tooling
- hazards and control measures associated with numerical and computer controlled machines, 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 set computer controlled machines/processes. 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 setting computer controlled machines/processes or other units requiring the exercise of the skills and knowledge covered by this unit.

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.	

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations
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MEM07016C Set and edit computer controlled machines/processes

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers setting work holding fixtures/devices/tools, setting tooling offsets, trialling the program, instructing the operator and replacing worn or damaged tooling.
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Application of the Unit

Application of the unit	<p>The unit applies to any computer or numerically controlled machine or process. Applications may include NC/CNC machines and industrial robots.</p> <p>Editing applies to identifying and accessing programs in edit mode in order to make changes associated with speeds, feed and operational sequence. Changes are generally made in situ.</p> <p>Work is performed to established processes, practices and specifications. Machine operations may include welding, thermal cutting, metal cutting, forming and shaping etc.</p> <p>All work and work practices are performed to instructions, plans and specifications as appropriate. Technical difficulties are resolved in consultation with appropriate technical advisers. Work is carried out autonomously to predetermined standards of quality and safety.</p> <p>Where additional machining skills in excess of Unit MEM07005C (Perform general machining) are required then appropriate units should also be selected.</p> <p>For setting and editing computer controlled thermal cutting machines, see Unit MEM05053A (Set and edit computer controlled thermal cutting machines)</p> <p>Band:</p> <p>This unit has dual status and is to be regarded as both a</p>
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	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		
Path 1	MEM07015B	Set computer controlled machines/processes
	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
Path 2	MEM07005C	Perform general machining
	MEM07015B	Set computer controlled machines/processes
	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify job requirements	1.1. Instructions/plans are understood and correctly followed.
2. Set work holding fixtures/devices/tools	2.1. Correct ancillary devices are selected and attached to machine using standard operating procedures. 2.2. Machine is prepared to accept work holding devices. 2.3. Work holding fixtures/devices/tools are set to zero or a datum using appropriate setting devices.
3. Set tooling offsets	3.1. Tooling offsets are measured and recorded in machine controller.
4. Trial program	4.1. Machine is operated to produce first-off samples, observing all safety procedures. 4.2. First-off samples are checked for compliance with specifications. 4.3. Program editing to change speeds, feed and operational sequence requirements is undertaken as required to ensure job conforms to specification.
5. Instruct machine operator	5.1. Operator is instructed if necessary ensuring that all safety procedures and devices are in place.
6. Replace worn or damaged tooling	6.1. Where appropriate, tools are replaced, tool offsets are adjusted or other corrective action is taken using

ELEMENT	PERFORMANCE CRITERIA
	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, 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
- attaching ancillary devices
- mounting work holding devices
- measuring tool offsets
- entering and verifying tool offsets
- producing and checking first-off samples
- editing programs
- instructing machine operator on the sequence of operations
- following safety procedures
- identifying worn or damaged tooling and taking appropriate corrective action

Required knowledge

Look for evidence that confirms knowledge of:

- ancillary equipment and its applications
- procedures for attaching the ancillary device(s) to the NC/CNC machine
- work holding devices, their application and procedures for mounting them
- location of work holding fixtures/devices/tools relative to the machine zero or datum
- reasons for establishing tool offsets
- procedures and devices for measuring tool offsets
- procedures for entering and verifying tool offset
- procedures for adjusting tool offsets
- operating procedures

REQUIRED SKILLS AND KNOWLEDGE

- safety features and equipment
- measuring devices/ techniques for checking the parts or product
- effects of changes to cutting feeds and speeds
- the impact of changes to the sequence of operations on the part or product to be produced
- procedures for editing programs via the machine controller
- the sequence of operations of the machine/process
- examples of worn or damaged tooling
- the effects of worn or damaged tooling
- the corrective action to be taken for worn or damaged tooling
- hazards and control measures associated with computer controlled machines, 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 set and edit computer controlled machines/processes. 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

EVIDENCE GUIDE	
	<p>disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with setting and editing computer controlled machines/processes or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	

RANGE STATEMENT	

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations
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MEM07018C Write basic NC/CNC programs

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers identifying computer controlled machine program elements, writing a basic program and operation sheet, and trialling the program.
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Application of the Unit

Application of the unit	<p>This unit extends to writing a program to describe simple machine operations including tool paths using appropriate software for machines which may incorporate single spindles, single tools turrets, B axis angular, tool changers and component loaders of a pallet type, but excludes multiple spindles. The program may use common M and G codes but does not include the programming of advanced operations using canned cycles and sub-routines.</p> <p>Machine operations may include welding, thermal cutting, metal cutting, forming and shaping etc. Programs are trialled and edited as necessary to adjust operation of the machine. Technical difficulties are resolved in consultation with appropriate technical advisers. Work would be undertaken autonomously using predetermined standards of quality.</p> <p>If programming of advanced operations using canned cycles and sub-routines is required, see Unit MEM07019C (Program NC/CNC machining centre). Where additional machining skills in excess of Unit MEM07005C (Perform general machining) are required, then appropriate units should also be selected.</p> <p>For basic programming of computer controlled thermal cutting machines, see Unit MEM05054A (Write basic NC/CNC programs for thermal cutting machines).</p> <p>Band:</p>
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	<p>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).</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
Path 2	MEM07005C	Perform general machining
	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements

Prerequisite units	
	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify basic NC/CNC machine program elements	1.1.Appropriate program elements are selected for machine controller.
2. Write basic NC/CNC machine program	2.1.Engineering drawings are understood and interpreted to define basic machine function and tool path geometry. 2.2.Coordinates are calculated for simple tool path or basic machining functions. 2.3.Program is written in standard code format in accordance with standard operating procedures.
3. Write NC/CNC operation sheet	3.1.Operation sheets are produced to specification in accordance with standard operating procedures.
4. Trial program	4.1.Machine is operated in manual mode to test and prove program as required. 4.2.Program is edited if necessary to adjust operation as

ELEMENT	PERFORMANCE CRITERIA
	<p>required.</p> <p>4.3.Components are checked for conformance to specification as required.</p>

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
- calculating coordinates of all relevant points on the part or product to be produced
- writing NC/CNC program in standard code format
- producing NC/CNC operation sheet(s)
- operating NC/CNC machine safely in manual mode
- editing NC/CNC program
- checking parts or products for conformance to specifications

Required knowledge

Look for evidence that confirms knowledge of:

- the elements of a basic NC/CNC program
- the function of elements in controlling the operation of an NC/ CNC machine
- machining operations
- type(s) of NC/CNC machine and their applications
- machining operations controlled by program
- the tool path(s) to be followed when producing a part or product
- the sequence of machining operations
- the reasons for selecting tool path(s) and sequence of operations
- the zero point of the NC/CNC machine
- standard codes used in the writing of NC/CNC programs
- applications of standard codes in NC/CNC programming

REQUIRED SKILLS AND KNOWLEDGE

- procedures for writing NC/CNC programs in standard code format
- procedures for completing NC/CNC operation sheets
- the information to be included in NC/CNC operation sheets
- procedures for manual operation of the NC/CNC machine
- reasons for testing and proving the NC/CNC program
- procedures for editing the NC/CNC program via the machine controller
- the effects of editing on the operation of the NC/CNC machine and the part or product to be produced
- the measuring equipment/techniques used to check for conformance to specification
- hazards and control measures associated with numerical and computer controlled machines, 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 basic NC/CNC programming. 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

EVIDENCE GUIDE	
	<p>should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing basic NC/CNC programming or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Basic	<p>Machines which incorporate single spindles, single tools turrets, B axis angular, tool changers and component loaders of a pallet type, but not multiple spindles</p>

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations
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MEM07019C Program NC/CNC machining centre

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers writing and trialling programs for NC/CNC machining centres.
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Application of the Unit

Application of the unit	<p>This unit extends to writing programs to describe machine operations including tool paths using appropriate software for machines which may incorporate single spindles, single tool turrets, tool changers, B axis angular, component loaders of the pallet type etc., but excludes multiple spindles and multiple axis. The program may use common M and G codes and includes the programming of advanced operations, using canned cycles and sub-routines. Programs are trialled and edited as necessary to adjust operation of centre. Technical difficulties are resolved in consultation with appropriate technical advisers.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
Path 2	MEM07005C	Perform general machining
	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify basic NC/CNC machine program elements	1.1.Appropriate program elements are selected for machine controller.
2. Write basic NC/CNC machine program	2.1.Engineering drawings are understood and interpreted to define machine function and tool path geometry. 2.2.Coordinates calculated as required for tool path or machine functions. 2.3.Advanced operations using canned cycles and sub-routines are selected and applied appropriately. 2.4.Program is written in standard code format in accordance with standard operating procedures.
3. Write NC/CNC operation sheet	3.1.Operation sheets are produced to specification in accordance with standard operating procedures which includes appropriate Australian standard where required.
4. Trial program	4.1.Machine is operated in manual mode to test and prove program. 4.2.Program is edited if necessary to adjust operation. 4.3.Components are checked to conform to specification.

Required Skills and Knowledge

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:

- interpreting engineering drawings, specifications and instructions
- calculating coordinates of all relevant points on the part or product to be produced
- writing NC/CNC program in standard code format and incorporating, where appropriate, canned cycles and sub-routines
- producing NC/CNC operation sheet(s)
- operating NC/CNC machine in manual mode
- editing NC/CNC program
- checking parts or products produced for conformance with specifications

Required knowledge

Look for evidence that confirms knowledge of:

- elements of an NC/CNC program
- the function of elements in controlling the operation of an NC/ CNC machine
- machining operations to be performed in the manufacture of the given part or product
- the appropriate type(s) of NC/CNC machine to perform the required machining operations
- the machining operations to be controlled by the program to be written
- the tool path(s) to be followed when producing the part or product
- the sequence of machining operations to be programmed
- reasons for selecting the chosen tool path(s) and sequence of operations
- the zero point of the NC/CNC machine
- the canned cycles and sub-routines accessible in the particular NC/CNC machine
- the application of each canned cycle and sub-routine available
- the canned cycles and/or sub-routines to be used in the NC/CNC program
- reasons for selecting the chosen canned cycles and/or sub-routines
- standard codes used in the writing of NC/CNC programs
- applications of standard codes in NC/CNC programming
- procedures for writing NC/CNC programs in standard code format
- procedures for completing NC/CNC operation sheets
- the information to be included in NC/CNC operation sheets
- relevant Australian standards
- procedures for manual operation of the NC/CNC machine
- the reasons for testing and proving the NC/CNC program
- the procedures for editing the NC/CNC program via the machine controller

REQUIRED SKILLS AND KNOWLEDGE

- the effects of editing on the operation of the NC/CNC machine and the part or product to be produced
- the specifications of the part or product
- the measuring equipment/techniques to be used to check for conformance with specifications

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 program a NC/CNC machining centre. 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 programming a NC/CNC machining centre or other units requiring the exercise of the skills and knowledge covered by this unit.

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.	

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations
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MEM07020C Program multiple spindle and/or multiple axis NC/CNC machining centre

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers identifying NC/CNC machine program elements, writing and trialling a machine program for multiple spindle and/or multiple axis NC/CNC machining centres, and preparing an operation sheet.
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Application of the Unit

Application of the unit	<p>This unit extends to writing programs to describe machine operations including tool paths using appropriate software for machines which include multiple spindles and/or multiple axis/B axis angular, multiple tool turrets, tool changers and may include component loaders of a pallet type etc.</p> <p>The program may use common M and G codes and include the programming of advanced operations, using canned cycles and sub-routines. Programs are trialled and edited as necessary to adjust operation of centre. Technical difficulties are resolved in consultation with appropriate technical advisers. Work would be undertaken autonomously using predetermined standards of quality.</p> <p>Where machining skills in excess of MEM07005C (Perform general machining) are required, then appropriate units should also be selected.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM07019C	Program NC/CNC machining centre
	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machines/processes
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
Path 2	MEM07005C	Perform general machining
	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM07019C	Program NC/CNC machining centre

Prerequisite units		
	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify NC/CNC machine program elements	1.1.Appropriate program elements are selected for machine controller.
2. Write NC/CNC machine program	2.1.Engineering drawings are understood and interpreted to define machine function and tool path geometry. 2.2.Coordinates are calculated as required for tool path or machine functions. 2.3.Advanced operations using canned cycles and sub-routines are selected and applied appropriately. 2.4.Program is written in standard code format in accordance with standard operating procedures.

ELEMENT	PERFORMANCE CRITERIA
3. Write NC/CNC operation sheet	3.1.Operation sheets are produced to specification in accordance with standard operating procedures which includes appropriate Australian standard where required.
4. Trial program	4.1.Machine is operated in manual mode to test and prove program. 4.2.Program is edited if necessary to adjust operation. 4.3.Components are checked to conform to 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 task related information
- calculating coordinates of all relevant points on the part or product to be produced
- writing NC/CNC program in standard code format and incorporating, where appropriate, canned cycles and sub-routines
- producing NC/CNC operation sheet(s)
- operating NC/CNC machine in manual mode
- editing NC/CNC program
- checking parts or products produced for conformance with specifications

Required knowledge

Look for evidence that confirms knowledge of:

- elements of an NC/CNC program
- the function of elements in controlling the operation of an NC/ CNC machine
- machining operations to be performed in the manufacture of the given part or product
- the appropriate type(s) of NC/CNC machine to perform the required machining operations

REQUIRED SKILLS AND KNOWLEDGE

- the machining operations to be controlled by the program to be written
- the tool path(s) to be followed when producing the part or product
- the sequence of machining operations to be programmed
- reasons for selecting the chosen tool path(s) and sequence of operations
- the zero point of the NC/CNC machine
- the canned cycles and sub-routines accessible in the particular NC/CNC machine
- the application of each canned cycle and sub-routine available
- the canned cycles and/or sub-routines to be used in the NC/CNC program
- reasons for selecting the chosen canned cycles and/or sub-routines
- standard codes used in the writing of NC/CNC programs
- applications of standard codes in NC/CNC programming
- procedures for writing NC/CNC programs in standard code format
- procedures for completing NC/CNC operation sheets
- the information to be included in NC/CNC operation sheets
- relevant Australian standards
- procedures for manual operation of the NC/CNC machine
- the reasons for testing and proving the NC/CNC program
- the procedures for editing the NC/CNC program via the machine controller
- the effects of editing on the operation of the NC/CNC machine and the part or product to be produced
- the specifications of the part or product
- the measuring equipment/techniques to be used to check for conformance with specifications
- hazards and control measures associated with numerical and computer controlled machines, 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 program multiple spindle and/or multiple axis NC/CNC machining centres. Competency in this unit cannot be claimed until all prerequisites have been

EVIDENCE GUIDE	
	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	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with programming multiple spindle and/or multiple axis NC/CNC machining centres or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>Work would be performed autonomously using predetermined standards of quality and safety.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07005C	Perform general machining

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.
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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.
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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

ELEMENT	PERFORMANCE CRITERIA
	<p>indicators etc.</p> <p>2.2. Work piece is balanced as required when using face plates to ensure accuracy in machining.</p> <p>2.3. Work piece is set up to ensure that work piece is free of distortion following completion of machining.</p>
3. Select and prepare tooling	<p>3.1. Tooling, accessories and consumables are selected appropriate to task, specifications and material.</p> <p>3.2. Where necessary, cutting tool modifications required to perform complex turning operations are determined.</p> <p>3.3. Tooling and accessories are prepared and modified as required.</p> <p>3.4. International Standard Organisation standards for cutting tools or other appropriate standards to suit cutting parameters are applied as necessary.</p>
4. Perform complex turning	<p>4.1. Speeds and feeds are correctly calculated using appropriate mathematical techniques and reference material.</p> <p>4.2. Complex turning is undertaken to specifications and workplace procedures.</p> <p>4.3. Work piece is measured and verified to be in accordance with specification using precision measuring equipment.</p>

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:

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

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

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	
<p>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.</p>	
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.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations
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MEM07022C Program CNC wire cut machines

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers writing and trialling a program for a range of CNC wire cut machines. Programming includes 2 axis tool paths, 4 axis conical cutting, and auto multi-cavity work pieces.
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Application of the Unit

Application of the unit	<p>This unit extends to programming a range of CNC wire cut machines. Programming includes 2 axis tool paths, 4 axis conical cutting, and auto multi-cavity work pieces. Technical difficulties are resolved in consultation with appropriate technical advisers. Work is carried out autonomously using predetermined standards of quality and safety.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	
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Prerequisite units		
Path 1	MEM07005C	Perform general machining
	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
Path 2	MEM07015B	Set computer controlled machines/processes
	MEM07016C	Set and edit computer controlled machines/processes
	MEM07018C	Write basic NC/CNC programs
	MEM07024B	Operate and monitor machine/process
	MEM07028B	Operate computer controlled machines/processes
	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Write program	<p>1.1.Engineering drawings are understood and interpreted to define optimum tool path geometry.</p> <p>1.2.Tool path is programmed using advanced operations, canned cycles and sub-routines or other appropriate sub-routines within system.</p> <p>1.3.Program is written in standard code format, and confirmed and edited as necessary using appropriate routine and standard operating procedures.</p> <p>1.4.Program is stored in accordance with standard operating procedures.</p> <p>1.5.Operation sheet is produced to standard operating procedures.</p>
2. Trial program	<p>2.1.Program is downloaded, and machining parameters that may include wire offset, wire speed, power settings are selected.</p> <p>2.2.Machine is prepared, work piece are loaded and aligned, datum and reference points are established in accordance with standard operating procedures.</p> <p>2.3.Machine is operated in appropriate mode to test and prove program, work piece positioning.</p> <p>2.4.Finished components are checked for conformance with drawing specifications.</p>

Required Skills and Knowledge

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:

- interpreting drawings, specifications and instructions
- calculating coordinates of all relevant points on the part or product to be produced
- storing programs
- producing NC/CNC operation sheet(s)
- downloading and verifying NC/CNC program
- setting machine parameters
- mounting work holding fixtures/ devices/tools
- testing and proving NC/CNC program
- checking parts or products produced for conformance with specifications

Required knowledge

Look for evidence that confirms knowledge of:

- the operations to be controlled by the program to be written
- the tool path(s) to be followed when producing the part or product
- the sequence of operations to be programmed
- the reasons for selecting the chosen tool path(s) and sequence of operations
- the zero point of the wire cut machine
- the canned cycles and sub-routines accessible in the particular NC/CNC machine
- the application of each canned cycle and sub-routine available
- where appropriate, the canned cycles and/or sub-routines to be used in the NC/CNC program
- the reasons for selecting the chosen canned cycles and/or sub-routines
- the standard codes used in the writing of NC/CNC programs
- the applications of standard codes in NC/CNC programming
- procedures for writing NC/CNC programs in standard code format
- procedures for storing NC/CNC programs
- procedures for completing NC/CNC operation sheets
- the information to be included in NC/CNC operation sheets
- procedures for downloading NC/CNC programs
- procedures for verifying downloaded NC/CNC programs
- the machining parameters that may be entered into the machine controller
- the effect of varying the machining parameters on the product or part produced
- work holding fixtures/devices/tools
- procedures for mounting work holding fixtures/devices tools
- the location of the required work holding fixtures/devices/tools relative to the

REQUIRED SKILLS AND KNOWLEDGE

- machine datum or zero
- purpose of datum setting
- pre-start checks
- safety features and equipment of the NC/CNC machine
- the purpose and function of the safety features and/or equipment
- the machine mode appropriate to the testing and proving of the NC/CNC program and the checking of the position of the work piece
- the procedures to be followed when using the machine in this mode
- the relative position of the work piece to the machine datum or zero
- the specifications of the part or product
- the measuring equipment/techniques to be used to check for conformance to specification

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 programming of CNC wire cut 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 unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

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 programming of CNC wire cut machines 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.	
Program	Includes setting of speeds, tolerances, taper angles, macros, nesting tool paths, chained linear tool paths and differential profiles

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations
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MEM07024B Operate and monitor machine/process

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers obtaining the job instruction, conducting the pre-start checks, and operating and monitoring the machine or process.
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Application of the Unit

Application of the unit	<p>This unit applies to a range of production operations or continuous processes. The work is performed in accordance with clear step-by-step instructions and procedures documented on job sheets or similar process instruction documents. Operational adjustments to the machine or process by the operator are made using external controls. Basic operation (excluding setting and tool adjustments) of CNC machines is covered by this unit.</p> <p>Where production packaging and labelling of the finished goods or product is required, Unit MEM11006B (Perform production packaging) should be considered.</p> <p>This unit should not be selected with any of the following units unless the skills of this unit are being applied to an additional and different type of machine and or process: Unit MEM04001B (Operate melting furnaces), Unit MEM04002B (Perform gravity die casting), Unit MEM04003B (Operate pressure die casting machine), Unit MEM04006B (Operate sand moulding and core making machines), Unit MEM06001B (Perform hand forging), Unit MEM06002B (Perform hammer forging), Unit MEM08001B (Perform wire, jig and barrel load/unload work), Unit MEM08004B (Finish work using wet, dry and vapour deposition methods), Unit MEM08008B (Operate and control surface finishing waste treatment process)</p>
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	Band: A Unit Weight: 4
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>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.</p>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Obtain job	1.1. Job sheets or equivalent instructions are interpreted

ELEMENT	PERFORMANCE CRITERIA
instructions	correctly.
2. Conduct pre-start checks	2.1.Pre-start checks are undertaken to standard operating procedure. 2.2.Safety procedures are observed and all safety equipment is checked for correct operation.
3. Operate machine/process	3.1.Machine/process is started up safely and correctly in accordance with standard operating procedures. 3.2.Machine/process is operated in accordance with job instructions or standard operating procedures. 3.3.Components/feed stock are loaded and maintained consistent with production requirements. 3.4.Machine/process output is unloaded safely to standard operating procedures, as required. 3.5.Machine/process output is handled and stored in a manner not likely to cause damage, as required. 3.6.Production data is recorded to standard operating procedures.
4. Monitor machine/process	4.1.Machine/process is monitored for safe and correct operation, deviations and faults are identified and reported in accordance with standard operating procedures. 4.2.Emergency procedures are understood and followed 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:

- following job sheets, standard operating procedures and other applicable workplace forms
- manual handling
- following oral instructions
- entering routine and familiar information onto proformas and standard workplace forms

REQUIRED SKILLS AND KNOWLEDGE

- orally reporting routine information
- identifying deviations and faults in machine operation/process

Required knowledge

Look for evidence that confirms knowledge of:

- pre-start checks
- machine/process start-up and unloading procedures
- component/feed stock levels to ensure continuous process
- production recording and reporting requirements
- types of product fault/deviations
- consequences of improper handling and storing of finished work
- procedures to be followed in emergency situations
- use and application of personal protective equipment
- safe work practices and procedures
- hazards and control measures associated with operating and monitoring machine/process

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 obtain the job instruction, conduct the pre-start checks, and operate and monitor the machine or process.

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

EVIDENCE GUIDE	
	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating and monitoring machine/process or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Pre-start checks	Condition of machine before operation
Machine/process	Machines and processes used in pressing, punching, plastic moulding, extruding, bending,

RANGE STATEMENT	
	joining, rolling, forming, drawing, metal removal, pickling, cylinder filling, printing, painting etc.
Production data	Production schedules, job sheets, checklists

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations
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MEM07028B Operate computer controlled machines/processes

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers obtaining the job instructions, conducting the pre-start checks, and operating and monitoring the computer controlled machine or process.
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Application of the Unit

Application of the unit	<p>This unit applies to a range of NC, CNC and robot operated machines or processes in a production environment.</p> <p>Work is performed to established processes, practices, specifications and instructions as appropriate. Technical difficulties are resolved in consultation with appropriate technical advisers.</p> <p>An appropriate level of measurement skill should be selected with this unit. Where it is required to use tools, then Unit MEM18001C (Use hand tools) should also be selected.</p> <p>Where basic operation excludes setting and tool adjustment skills, then Unit MEM07024B (Operate and monitor machine/process) should be selected.</p> <p>When operational maintenance is required, unit MEM07001B (Perform operational maintenance of machines/equipment) should be selected.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07024B	Operate and monitor machine/process

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Obtain job instructions	1.1. Job sheets or equivalent instructions are understood and correctly followed.
2. Conduct pre-start checks	2.1. Pre-start checks are undertaken to standard operating procedures. 2.2. Correct safety procedures are observed and all safety equipment is checked for correct operation.
3. Operate computer	3.1. Installed computer controlled program is selected

ELEMENT	PERFORMANCE CRITERIA
controlled machine/process	<p>and verified in accordance with job instructions.</p> <p>3.2.Computer controlled machine is operated safely to product specifications using standard operating procedures.</p> <p>3.3.Machine malfunctions are identified and reported.</p> <p>3.4.Production samples are checked for compliance to specification using standard operating procedures.</p>
4. Monitor machine/process	<p>4.1.Tool wear is monitored and, where appropriate, preset tools are replaced, tool offsets are identified in computer controlled program and adjusted, or other corrective action is taken using standard operating procedures.</p> <p>4.2.Product deviation from specification is reported in accordance with standard operating procedures.</p>

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
- making pre-start checks
- checking safety equipment and guards for correct operation
- following safety procedures
- selecting and verifying the correct computer controlled program
- operating the computer controlled machine
- identifying and reporting machine malfunctions
- checking parts/products for conformance to specification
- monitoring the machine or process for signs of tool wear
- taking corrective action
- reporting part or product deviations from specification

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Look for evidence that confirms knowledge of:

- pre-start checks
- safety equipment and features associated with the machine/process
- safety procedures associated with the machine/process
- procedures for accessing computer controlled programs installed in the machine controller
- procedures for verifying the correct computer controlled program
- computer controlled machine operating procedures
- typical machine malfunctions
- procedures for reporting machine malfunctions
- measuring instruments/techniques
- examples of tool wear and the effect on product or part specifications
- procedures to be followed once tool wear has been detected
- replacing preset tools
- adjustments to tool offsets
- the effect of adjustments on part or product specifications
- procedures for reporting product or part deviations
- hazards and control measures associated with operating computer controlled machines/processes, including housekeeping
- safe workplace 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 operate computer controlled machine/processes. 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

EVIDENCE GUIDE	
	knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating computer controlled machine/processes or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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

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.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Machine and process operations
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MEM07030C Perform metal spinning lathe operations (basic)

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing basic metal spinning operations (excluding CNC), using a variety of processes, spinning tools and accessories.
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Application of the Unit

Application of the unit	<p>This unit applies to manual metal spinning of sheet metals. Spinning does not include hot spinning procedures. Tool use will include either hand and/or slide tooling of varying design and materials.</p> <p>Where operational maintenance requires dismantling and replacing components, Unit MEM18055B (Dismantle, replace and assemble engineering components) should also be selected.</p> <p>If annealing is required, the appropriate unit MEM05007C (Perform manual heating and thermal cutting) should also be selected.</p> <p>Where disc blanks are cut out using a dedicated circle cutter or similar, Unit MEM07032B (Use workshop machines for basic operations) should also be selected.</p> <p>If the interpretation of technical drawings is required Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Band: A</p> <p>Unit Weight: 8</p>
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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.
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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.
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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 are worn.
2. Determine job requirements	2.1. Drawings are interpreted and sequence of operation is determined. 2.2. Tools are selected to produce components to

ELEMENT	PERFORMANCE CRITERIA
	<p>specifications.</p> <p>2.3. Disc size is determined in accordance with appropriate procedures.</p>
3. Perform spinning operations	<p>3.1. Spinning speeds are calculated for various metals and metal thicknesses using appropriate mathematical techniques and reference materials.</p> <p>3.2. Correct back centre and form chucks are selected and mounted in accordance with procedures and specifications.</p> <p>3.3. Prepared disc is mounted for forming.</p> <p>3.4. A full range of spinning accessories is used including: back centre, various chucks, trimming accessories, blank centre equipment and tee-rest.</p> <p>3.5. Spinning operations are performed to specifications.</p>
4. Check components for conformance to specifications	4.1. Components are checked for conformance to specifications using appropriate techniques, tools and equipment.
5. Remove and store components	<p>5.1. Components are removed from the spinning lathe without marking or any deformation.</p> <p>5.2. Components are correctly stored and packaged to avoid oxidation and damage.</p>
6. Adjust and maintain spinning lathe	6.1. Routine maintenance and adjustments are carried out 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:

- reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings
- following oral instruction
- entering routine and familiar information onto proformas and standard workplace forms
- using all basic metal spinning tools

REQUIRED SKILLS AND KNOWLEDGE

- minimising damage and defects
- calculating disc size and lathe speed
- undertaking manual handling related to spinning products
- using appropriate techniques, tools and equipment to measure materials and spinings

Required knowledge

Look for evidence that confirms knowledge of:

- sequence of spinning operation
- types of spinning tools, their functions and requirements for maintaining tools
- types of damage and defects e.g. tool marks, cracking, stress marks, thinning and incorrect finish
- spinning lathe operation
- why and how lathe speed is calculated
- reasons for types of form chuck mounting
- function and operation of accessories for basic spinning
- methods used for each process
- methods for stacking and protecting finished product
- use and application of personal protective equipment
- safe work practices and procedures
- hazards and control measures associated with metal spinning lathe operations (basic)

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 metal spinning 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

EVIDENCE GUIDE	
	knowledge, and be capable of applying the competency in new and different situations and contexts.
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing basic metal spinning lathe operations or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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

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.

Tools	Spinning tools, planishing tools, backstick, trimming, beading tools etc.
Metals	Steel, aluminium, monel, copper, brass, zinc, pewter, silver, gold, tin, etc. of varying thicknesses
Reference materials	Workplace reference materials
Spinning operations	Spinning, beading, trimming, finishing, annealing and/or pickling
Maintenance and adjustments	Cleaning, lubrication etc.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Machine and process operations
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MEM07031C Perform metal spinning lathe operations (complex)

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing complex metal spinning operations (excluding CNC), using a variety of advanced processes, spinning tools and accessories.
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Application of the Unit

Application of the unit	<p>This unit applies to complex spinning operations which require preparation of form chucks, oval spinning, thread spinning, or jobs requiring higher precision or quality using mainly brass and brass alloys. This unit also requires the use of a wide range of spinning accessories and processes, including the use of annealing.</p> <p>Where there is a requirement to join spun materials or products in addition to, or instead of, (the spinning operation of) swaging, the following units may also be required: Unit MEM05003B (Perform soft soldering), Unit MEM05006B (Perform brazing and/or silver soldering), or Unit MEM05004C (Perform routine oxy acetylene welding [fuel gas welding]), or Unit MEM05012C (Perform routine manual metal arc welding)</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07030C	Perform metal spinning lathe operations (basic)
	MEM07032B	Use workshop machines for basic operations
	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.
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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 are worn.

ELEMENT	PERFORMANCE CRITERIA
2. Determine job requirements	2.1. Drawings are interpreted and sequence of operation is determined. 2.2. Tools are selected to produce components to specifications. 2.3. Disc size is determined according to relevant procedures. 2.4. Disc is cut to the correct size and tolerance.
3. Prepare form chucks for spinning	3.1. Metal turning lathe is set up for machining form chucks according to standard operating procedures and standards. 3.2. Form chuck is prepared for general spinning as per drawings and specifications. 3.3. Form chuck is prepared for seaming/swaging joints as per drawings and specifications.
4. Perform complex spinning operations	4.1. Spinning speeds are calculated for various metals and metal thicknesses using appropriate mathematical techniques and reference materials. 4.2. Correct back centre and form chucks are selected and mounted according to procedures and specifications. 4.3. Prepared disc is mounted for forming. 4.4. A full range of spinning accessories is used including: back centre, holding and sectional chucks, tee-rest, compound and additional slides, recessed and cranked followers, rollers and knurling wheels. 4.5. Spinning, beading, recessing, oval spinning, screw forming, (thread spinning) seaming, swaging, trimming finishing, annealing and pickling operations are performed to specification.
5. Check components for conformance to specifications	5.1. Components are checked for conformance to specifications using appropriate techniques, tools and equipment.
6. Remove and store components	6.1. Components are removed from the spinning lathe without marking or any deformation. 6.2. Components are correctly stored and packaged to avoid oxidation and damage.

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 information on written job instructions, specifications and standard operating procedures. May include drawings
- entering information onto proformas and standard workplace forms
- following oral instruction
- using all types of metal spinning tools and accessories
- calculating disc size and lathe speed including angles and radius
- manual handling related to spinning products
- coordinating use of multi-slides and tools, feeds and speeds
- producing complex spinning shapes using a variety of processes and techniques

Required knowledge

Look for evidence that confirms knowledge of:

- complex spinning operations, processes and techniques
- requirements for maintaining tools and manufacturing form chucks
- types of damage and defects e.g. tool marks, cracking, stress marks, thinning and incorrect finish
- function and operation of accessories
- methods used for each process
- methods for stacking and protecting finished product
- use and application of personal protective equipment
- safe work practices and procedures
- hazards and control measures associated with metal spinning lathe operations (complex)

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.

EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform complex spinning operations using a range of metal spinning lathes, accessories and measuring equipment. 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	<p>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 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.</p> <p>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 metal spinning lathe operations or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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	
<p>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.</p>	
Tools	Spinning tools, planishing tools, backstick, trimming, beading tools, back centre, holding and sectional chucks, tee-rest, compound and additional slides, recessed and cranked followers, rollers and knurling wheels etc.
Complex spinning operations	Spinning, beading, recessing, oval spinning, screw forming, (thread spinning) seaming, swaging, trimming finishing, annealing, pickling, combined angles and multi-radii
Metals	Steels, aluminium, monel, copper, brass, brass alloys, zinc, pewter, silver, gold, tin, etc., of varying thicknesses

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Machine and process operations
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MEM07032B Use workshop machines for basic operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers basic machining in a maintenance or jobbing environment.
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Application of the Unit

Application of the unit	<p>The unit applies to machines that include but are not limited to lathe, radial arm drill, mills etc., and covers the sharpening of tools as required.</p> <p>This unit should not be selected when Unit MEM07005C (Perform general machining) or Unit MEM07024B (Operate and monitor machine/process) have already been selected.</p> <p>For hand held/power tools use Unit MEM18002B (Use power tools/hand held operations).</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools

Prerequisite units	

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify job requirements.	<p>1.1. Job requirements are interpreted from work instructions and standard operating procedures.</p> <p>1.2. Appropriate machine is selected to meet requirements.</p>
2. Set up machine	<p>2.1. Tools are selected appropriate to the work requirements.</p> <p>2.2. Cutting tools are sharpened as required.</p> <p>2.3. Tools are correctly installed using standard operating procedures.</p> <p>2.4. Guards are set and adjusted as required.</p>
3. Operate machine	<p>3.1. Material to be machined is mounted and secured using clamping device appropriate to the material and work requirements.</p> <p>3.2. Machine is operated correctly to suit work and material requirements.</p>

ELEMENT	PERFORMANCE CRITERIA
4. Check finished component	4.1.Machined component is checked against work requirements and predetermined finish.

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 routine and familiar information on written job instructions, standard operating procedures and other applicable reference documents
- selecting the appropriate machine for the given task
- setting up machines and tooling within the scope of this unit, including speeds and feeds
- sharpening tools within the scope of this unit
- operating machines within the scope of this unit
- checking finished components
- checking and clarifying task-related information
- measuring components to specification within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- cutting tool sharpening methods and techniques
- tool geometry within the scope of this unit
- units of measurement, tool geometry and numerical operations within the scope of this unit
- safe operation of tool sharpening equipment
- consequences of incorrect sharpening
- machine set-up
- consequences of incorrect speeds and feeds
- procedures for operating workshop machines
- reasons for poor surface finish.
- hazards and control measures
- use and application of personal protective equipment
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to use workshop machines for basic operations. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with using workshop machines for basic operations or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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</p>

EVIDENCE GUIDE	
	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	
<p>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.</p>	
Machines	Lathe, radial arm drill, mill etc.
Cutting tools	Lathe tools, milling cutters, drills etc.
Materials	Ferrous and non ferrous
Clamping device	Chucks, vices, clamps, bars and packing etc.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Co-requisite units		

Competency field

Competency field	Machine and process operations
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MEM08001B Perform wire, jig and barrel load/unload work

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers loading barrels for mass finishing processes, undertaking jig work for non-electrolytic processes, undertaking wire jig and rack work for non-electrolytic processes, and unloading and removing jigs after finishing.
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Application of the Unit

Application of the unit	<p>This unit applies to loading and unloading in preparation for a wide variety of pre-treatment and finishing processes of multiples of similar items.</p> <p>Typical processes include degreasing, de-scaling, surface blasting, flame cleaning, wet blasting, grinding, polishing, wet coating, powder coating, electroplating, anodising, electroless plating, electrophoretic coating and hot dip metallising.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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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.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Load barrels etc., for mass finishing processes	1.1.Machinery is correctly loaded regarding load mass. 1.2.Machine access openings are safely secured.
2. Undertake jig work for non-electrolytic processes	2.1.Components are appropriately secured using standard operating procedures.
3. Undertake wire jig and rack work for electrolytic processes	3.1.Correct type and size of wire or rack is selected and inspected for conformance to specification. Damaged racks are identified for repair or replacement. 3.2.Components are secured presenting appropriate faces 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:

- correctly loading into the surface finishing machinery
- securing and positioning components to minimise damage
- securing machine access openings
- unloading and stacking components to minimise damage
- selecting the correct type and size of wire or rack
- planning and sequencing operations
- checking and clarifying task related information
- checking for conformance to specifications
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings
- following oral instructions
- performing calculations using formulae

Required knowledge

Look for evidence that confirms knowledge of:

- the procedures for loading machinery for mass finishing processes
- the distribution of the components within the machinery
- reasons for distributing the components in a particular manner
- the procedures for securing machine access openings
- the consequences of not securing machine access openings
- the procedures for jiggging work for non-electrolytic processes
- the precautions to be taken when jiggging work for non-electrolytic finishing processes
- the appropriate types and sizes of wire or racks used in conjunction with surface finishing using electrolytic processes
- different faces to be surface finished/coated
- procedures for securing the components to be surface finished using electrolytic processes
- procedures for unloading and stacking surface finished components
- the damage that can be caused by inappropriate handling and storing of surface finished components
- hazard and control measures associated with wiring, jiggging and barrel load/unloading work
- safe workplace practices and procedures

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	<p>A person who demonstrates competency in this unit must be able to perform wire, jig and barrel load/unload work related to non-electrolytic processes.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p>
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing wire, jig and barrel load/unload work related to non-electrolytic processes or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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</p>

EVIDENCE GUIDE	
	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	
<p>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.</p>	
Non-electrolytic processes	Pre-treatment and finishing processes typical of which are degreasing, de-scaling, surface blasting, flame cleaning, wet blasting, grinding, polishing, wet coating, powder coating, electroplating, anodising, electroless plating, electrophoretic coating and hot dip metallising
Components	Refer to components supplied by the customer
Damaged racks	<ul style="list-style-type: none"> • Damage to plastic coating or contact points • Ensuring good electrical contact • Positioning to facilitate optimum thickness on significant surfaces • Avoidance of gas entrapment • The position of contact marks

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing
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MEM08002C Pre-treat work for subsequent surface coating

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers pre-treating common ferrous and non-ferrous work.
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Application of the Unit

Application of the unit	<p>This unit applies to pre-treatment of common ferrous and non-ferrous work for finishing by a wide variety of processes, such as wet coating, powder coating, electroplating, anodising, electroless plating, electrophoretic coating and hot dip metallising.</p> <p>In the pre-treatment process, adjustments to apparatus/equipment/controls include temperature settings, current/voltage and solution compositions.</p> <p>This unit should not be selected if Unit MEM08003C (Perform electroplating operations) has already been selected.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	
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Prerequisite units		
Path 1	MEM13003B	Work safely with industrial chemicals and materials

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify job material	1.1.Common metals, alloys and non-metals can be identified.
2. Identify job surface condition	2.1.Common surface soils and conditions can be identified.
3. Perform pre-treatment processes in correct sequence	3.1.Pre-treatment processes are carried out to standard operating procedures. 3.2.Pre-treatment process parameters are monitored to ensure they remain within specified limits.

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 routine and familiar information on standard operating procedures
- recognising common surface soils and conditions from given samples
- carrying out appropriate pre-treatment processes
- monitoring and maintaining the pre-treatment process parameters within specified limits
- following verbal instructions
- orally reporting routine information

Required knowledge

Look for evidence that confirms knowledge of:

- characteristics of common metals, alloys and non-metals and procedures and techniques for identifying them
- common surface soils and conditions
- procedures for identifying the type(s) of soil on surfaces to be finished
- simple tests that can be used to assist in identifying surface soils and conditions
- pre-treatment processes applicable to a range of materials, surface soils and conditions
- procedures for carrying out pre-treatment processes
- parameters and procedures for monitoring pre-treatment processes
- hazards and control measures associated with pre-treatment
- 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.

EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to pre-treat common ferrous and non-ferrous materials. 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	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with pre-treating common ferrous and non-ferrous materials or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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	
<p>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.</p>	
Common metals	Steel, copper, brass, zinc, cast iron, stainless steel
Surface soils and conditions	Oils, greases, drawing compounds, cutting lubricants, buffing lubricants, rust and scale
Pre-treatment processes	Solvent degreasing, alkaline cleaning, pickling, acid dipping
Process parameters	Temperature, time, currents, solution concentrate

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing
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MEM08003C Perform electroplating operations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	
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Application of the Unit

Application of the unit	<p>This unit applies to a range of metal plating processes in the electroplating, electronics, jewellery manufacture, and metal fabrication industries. It covers the general operation, monitoring and adjustment of manual, semi and automatic electroplating processes. It includes volume production and 'jobbing' involving rack and barrel type processes.</p> <p>This unit should not be selected if Unit MEM07025B (Perform advanced machine/process operation) has already been selected. Where simple operating and monitoring of the electroplating process is required, Unit MEM07024B (Operate and monitor machine/process) should be considered</p> <p>Band: A</p> <p>Unit Weight: 6</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	
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Prerequisite units		
Path 1	MEM07001B	Perform operational maintenance of machines/equipment
	MEM08001B	Perform wire, jig and barrel load/unload work
	MEM13003B	Work safely with industrial chemicals and materials
	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify electroplating requirements	1.1. Electroplating requirements are identified. 1.2. Untreated materials and required electroplating treatment are identified.
2. Prepare for electroplating process	2.1. Materials and racking arrangement are checked for non-conformance to specifications/job requirements. 2.2. All plant and equipment relevant to process are checked for compliance with safety and operational

ELEMENT	PERFORMANCE CRITERIA
	requirements. 2.3. Instrumentation/gauges are checked for operation. 2.4. Condition of solution is checked.
3. Perform electroplating operations	3.1. Operation steps are carried out in correct sequence according to standard operating procedures or work instructions. 3.2. Safety precautions are observed.
4. Recognise and rectify process deviations	4.1. Compliance with operating parameters is ensured. 4.2. Uncontrollable variances are reported to appropriate persons. 4.3. Adjustments are made to rectify process deviation. 4.4. Finished products are visually inspected for compliance to 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:

- recognising deviations and faults in product/equipment/process
- identifying machine process requirements, untreated materials and process sequences
- identifying incorrectly loaded work
- inspecting job surface conditions
- checking plant and equipment for conformance to safety and operational requirements
- checking solution levels and identifying visible contamination such as solution clarity, oil, surface contamination
- maintaining required contacts and immersions while moving materials
- monitoring operating parameters, identifying deviations and making required adjustments
- adjusting settings such as voltage, current and temperature within permissible limits
- correcting deviations within scope operator's control
- reading and interpreting routine information on written job instructions,

REQUIRED SKILLS AND KNOWLEDGE

- specifications and standard operating procedures. May include drawings
- following oral instructions
 - performing calculations using formulae

Required knowledge

Look for evidence that confirms knowledge of:

- basic knowledge of electroplating process, machine components, treatment solutions, process parameters
- a basic knowledge of electroplating solutions and handling procedures
- treatment stages
- information relevant to plating products, treatment baths, settings
- characteristics of a variety of base materials that can be plated
- pre-treatment s, treatments and post treatments in relation to task requirements
- required equipment checks
- hazards and control measures associated with electroplating processes
- operational requirements of all plant and equipment associated with the relevant process
- the purpose and typical settings of different instruments/gauges
- sequences and requirements involved in moving materials
- the range of adjustments permissible for given operating parameters including voltage, current and temperature
- variances outside the control of the operator
- common faults and imperfections/deviations
- adjustments to suit specific process deviations
- effects of rust, corrosion and other contaminants
- the reasons for rejecting incorrectly loaded work
- safe operating procedures, safety and personal protective equipment, hazards of specific solutions

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 start up, operate and monitor an electroplating

EVIDENCE GUIDE	
	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	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with starting up, operating and monitoring an electroplating process or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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	
<p>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.</p>	
Electroplating requirements	Coating thickness, appearance, ductility, hardness, corrosion resistance, wear
Untreated materials	Steel, copper, brass, cast iron, stainless steel
Electroplating treatment	<ul style="list-style-type: none"> • Pre-treatment • Electroplating operations • Post treatment
Checked	Equipment checking includes componentry, electrodes, circuitry equipment
Instruments and gauges	<ul style="list-style-type: none"> • Volt meters, AMP meters, temperature recorders/indicators • AMP per hour meters
Electroplating operations	Engineering coatings, protective finishes, decorative plating
Work instructions	Standard operating procedures, verbal and written job instructions, job cards, specifications, drawings
Adjustment	Time, temperature, current density, voltage
Visual inspection	Surface texture, brightness, free from roughness, pitting, cracking, machining marks

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing
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MEM08004B Finish work using wet, dry and vapour deposition methods

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit applies to finishing work using a range of wet and dry organic coatings.
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Application of the Unit

Application of the unit	<p>Processing may be carried out in manual, semi or fully automatic plant. Applications may be by hand or utilising a wide range of machines or plant.</p> <p>Work is conducted under supervision.</p> <p>Where straightforward monitoring of semi or automatic machine or process is undertaken, then Unit MEM07024B (Operate and monitor machine/process) should be considered.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM08002C	Pre-treat work for subsequent

Prerequisite units		
		surface coating
	MEM13003B	Work safely with industrial chemicals and materials

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Assess and prepare components for required coating process	1.1.Coating specifications are identified from operation sheets/work procedures. 1.2.Suitability of pre-treated components for finishing process is checked according to enterprise procedures. 1.3.Components are prepared as required for finishing application. 1.4.Components are positioned/located for finishing according to enterprise procedures.
2. Perform simple mixing and estimating operations	2.1.Mixing ratios are calculated and a range of wet coatings are mixed and thinned as required to standard operating procedures. 2.2.Required coating quantities are estimated using

ELEMENT	PERFORMANCE CRITERIA
	simple surface area calculations.
3. Perform coating operation	3.1. Equipment is set up to specification using standard operating procedures. 3.2. Coating and applied curing technique are monitored to standard operating procedures. 3.3. Coating application, thickness and colour are checked and maintained for compliance with 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:

- obtaining all relevant drawings, specifications and/or instructions in accordance with work place procedures
- racking the components to be coated correctly in accordance with standard operating procedures
- calculating the correct mixing ratios for given wet coatings accurately
- where appropriate, mixing and thinning the given wet coatings
- calculating the surface area to be coated correctly
- where appropriate, estimating the quantities of wet coating materials correctly
- setting up the appropriate coating equipment
- applying the coating correctly using the appropriate technique
- curing the coating correctly using the appropriate technique
- maintaining the coating thickness and colour in accordance with specifications throughout the coating operation
- checking the coating thickness and colour
- 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
- performing numerical operations, geometry and calculations/formulae within the

REQUIRED SKILLS AND KNOWLEDGE

scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- work to be undertaken
- coating process to be used
- coating specifications
- appropriate type of racking for the coating process
- reasons for selecting the chosen rack type
- procedures for racking components to be coated
- source of data on mixing ratios for wet coatings
- mixing ratio for the given task(s)
- function of thinners as applied to the application of wet coatings
- procedures to be followed when mixing wet coatings
- surface area to be coated
- coverage rate of the coating material to be applied
- procedures for estimating quantities of coating materials
- types of equipment used for a variety of coating processes
- appropriate coating equipment for the given task(s)
- reasons for selecting the chosen equipment
- operating procedures applicable to the selected coating equipment
- a range of coating techniques
- a range of curing techniques
- appropriate coating and curing technique for the given task(s)
- reasons for selecting the chosen coating and curing techniques
- monitoring procedures to be followed
- examples of coating defects
- the causes of coating defects
- where appropriate, procedures for rectifying coating defects
- where appropriate, procedures for reporting coating defects
- coating thickness and colour to be achieved
- the means of checking coating thickness and colour
- frequency at which checks are undertaken
- hazards and control measures associated with finishing work using wet, dry and vapour deposition methods, including housekeeping
- safe work practices and procedures
- use of personal protective equipment

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	<p>A person who demonstrates competency in this unit must be able to finish work using wet, dry and vapour deposition methods. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p>
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with finishing work using wet, dry and vapour deposition methods or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>

EVIDENCE GUIDE

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.

Coating

Electrostatic powder coating, electrophoretic coating, industrial spray coating and lacquering, electroless (auto catalytic) nickel or copper plating, phosphating, chromating, galvanising, hot tinning, sputter deposition, vacuum evaporation, ion plating, paints, stains and other liquid finishes

Prepared

Visual inspection for contamination, masking out, racking, identification of correct materials to be used, ensuring cleanliness of work area and equipment, operational testing of equipment

Coating operation

Spray application, dip coating

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing
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MEM08006B Produce clear and/or coloured and/or sealed anodised films on aluminium

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers producing anodised coatings on aluminium
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Application of the Unit

Application of the unit	<p>This unit applies to the production of sealed anodised films on aluminium and its alloys. Films may be clear or coloured. Colouring is produced by dyeing or by 'in-bath' processes. Applications include electrical, decorative, mechanical and architectural purposes.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM08002C	Pre-treat work for subsequent surface coating

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Perform a series of anodising steps	1.1. All steps are carried out in the correct sequence to standard operating procedures. 1.2. Masking techniques are correctly applied, where required. 1.3. Contact marks and shielding are minimised.
2. Assess preparation of work for correct jiggging/loading	2.1. Work is correctly connected for the required current flow and minimum contact marks and shielding. 2.2. All incorrectly loaded work is rejected.
3. Anodise work by a series of treatment steps	3.1. All steps are carried out in the correct sequence to standard operating procedures.
4. Seal or dye and seal anodised work	4.1. All steps on work are carried out in the correct sequence to standard operating procedures.
5. Monitor and control operating parameters	5.1. Process parameters are maintained within specified limits.

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 routine and familiar information on standard operating procedures
- following all steps in the anodising process
- applying the correct masking materials and techniques
- minimising contact marks and shielding
- correctly connecting the work to the required electrical current
- identifying incorrectly loaded work
- maintaining process parameters within specified limits
- following verbal instructions
- orally reporting routine information

Required knowledge

Look for evidence that confirms knowledge of:

- process for anodising aluminium
- materials, techniques and procedures for masking materials during anodising
- causes of contact marks and shielding during the anodising process
- procedures for minimising contact marks and shielding
- procedures for connecting the work to the required electrical current
- the electrical current required for the anodising process
- methods for correctly loading work
- examples of incorrectly loaded work
- reasons for rejecting incorrectly loaded work
- steps to be carried out in the seal/dye and seal process
- procedures and reasons for monitoring and maintaining the process parameters within the specified limits
- hazards and control measures associated with anodising operations, including housekeeping
- use and application of personal protective equipment
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to produce clear and coloured and sealed anodised films on aluminium and its alloys for decorative, mechanical and architectural purposes. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with anodising aluminium or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Anodising steps	Pre treatment, anodising, dyeing, sealing
Masking techniques	Taping, waxing
Process parameters	Temperature, current density, time

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing
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MEM08018B Electroplate engineering coatings

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers applying engineering metallic/ceramic coatings to ferrous and non-ferrous metals and some non-metallic materials e.g. plastics.
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Application of the Unit

Application of the unit	<p>This unit applies to producing engineering coatings designed to promote wear resistance, protect against corrosion, reclaim worn components. It also applies to manufacturing components (electroforming).</p> <p>For surface preparation operations, Unit MEM08011B (Prepare surfaces using solvents and/or mechanical means) and Unit MEM08012B (Prepare surfaces by abrasive blasting [basic]) should be selected as appropriate.</p> <p>Straightforward operation of electroplating process is covered by Unit MEM08003C (Perform electroplating operations).</p> <p>Where pre-treatment operations only are carried out, Unit MEM08002C (Pre-treat work for subsequent surface coating) should be selected.</p> <p>For basic inspection of completed or partly completed products produced by others, Unit MEM15004B (Perform inspection) should be selected.</p> <p>For construction of anodes, shields/robbars etc., the appropriate fabrication units should be selected.</p> <p>Where dogging/lifting is undertaken, the appropriate materials handling units should be selected.</p> <p>Band: A</p>
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	Unit Weight: 6
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07001B	Perform operational maintenance of machines/equipment
	MEM08001B	Perform wire, jig and barrel load/unload work
	MEM08003C	Perform electroplating operations
	MEM13003B	Work safely with industrial chemicals and materials
	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Select treatments and processes/equipment for producing engineering finishes	1.1.Appropriate treatment processes are selected according to base metal type, surface condition and relevant job specifications. 1.2.Operating/process parameters are selected to achieve required coating. 1.3.Appropriate equipment is selected.
2. Prepare work for engineering finishes	2.1.Products are correctly masked (stopped off) for selective plating. 2.2.Where applicable, conforming anodes are constructed and fitted correctly. 2.3.Where applicable, shields and robbers are constructed and fitted. 2.4.Pre-treatment processes are carried out, where applicable.
3. Monitor and control operating conditions and processes for engineering coatings	3.1.Operating/process parameters are set to produce required surface conditions/specifications. 3.2.Surface conditions of finished components are monitored and confirmed and abnormalities are identified. 3.3.Corrective actions are taken to rectify non-conforming conditions.
4. Maintain solutions for engineering finishes	4.1.Solution compositions are checked and confirmed to specification/operating range. 4.2.Adjustment requirements/additions are determined. 4.3.Additions are made to adjust solution composition to correct operating range.

Required Skills and Knowledge

<p>REQUIRED SKILLS AND KNOWLEDGE</p> <p>This section describes the skills and knowledge required for this unit.</p>
<p>Required skills</p>
<p>Look for evidence that confirms skills in:</p>

REQUIRED SKILLS AND KNOWLEDGE

- selecting treatments and processes/equipment for producing engineering finishes
- preparing work for engineering finishes
- calculating process parameters
- determining current densities
- assessing material condition for suitability for plating
- selecting equipment, masking, materials
- correctly sizing positioning and securing anodes
- sizing, positioning and securing shields and robbers
- carrying out mechanical/chemical pre-treatment
- setting times voltages/currents and temperature
- monitoring and controlling operating conditions and processes for engineering coatings
- maintaining solutions for engineering finishes

Required knowledge

Look for evidence that confirms knowledge of:

- effects of plating process on different materials
- conditions affecting engineering finishes
- base metal types
- surface finish of untreated material
- mechanical/chemical and specialised pre-treatment processes
- process parameters for achieving different coatings
- characteristics of different surface finishes
- masking materials and masking techniques
- safe operation of equipment to produce engineering finishes
- current distribution principles
- methods of constructing/fabricating, fitting anodes
- current-capacity of conforming/auxiliary anodes
- the role, construction, properties, applications, and positioning of shields and robbers
- finish requirements, permissible tolerances
- the causes of abnormalities and their related corrective actions
- purpose and application of simple tests including pH, titration, density
- calculations related to additions/adjustments to solution and of product surface area
- safe work practices and procedures, including handling chemicals

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to apply electroplate engineering coatings. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication materials handling, recording and reporting associated with applying electroplate engineering coatings or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE

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.

Treatment processes	Electroplating, electroforming, electroless plating
Operating/process parameters	Treatment times and currents, bath pH temperatures and densities, anode conditions, addition agent content, cleanliness of contacts etc., make-up, maintenance of solution levels and purity
Coating	Hard chroming, heavy nickel, electroless nickel, nickel composites, heavy deposits of nickel, copper, bronze up to 10 mm
Equipment	Wire racks, handling equipment, barrels, jigs, shields, robbers, etc.
Products	Base materials such as cast iron, brass, steels with machine welded sections, etc.
Masking materials	Wax, lacquers, tapes, foils
Anodes	Soluble, insoluble auxiliary anodes, etc.
Solution compositions	Cleaning, pickling, electroplating, chromate, acid dips
Checks	Density, titration, pH
Adjustment	Strength of solutions, temperature range

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Surface finishing
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>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).</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

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.
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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.

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

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
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	<p>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.</p> <p>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.</p>
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.

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	
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Co-requisite units

Co-requisite units	

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
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>Band: A</p> <p>Unit Weight: 8</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify drawing requirements	<p>1.1. Requirements and purpose of drawing are determined from customer and/or work specification and associated documents.</p> <p>1.2. All data necessary to produce the drawing is identified and collected.</p> <p>1.3. Drawing requirements are confirmed with relevant personnel and timeframes for completion are established.</p>
2. Prepare or make changes to engineering drawing	<p>2.1. Drafting equipment is selected appropriate to the drawing method chosen.</p> <p>2.2. Drafting principles are applied to produce a drawing that is consistent with standard operating procedures</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>within the enterprise.</p> <p>2.3.All work is undertaken safely and to prescribed procedure.</p> <p>2.4.Completed drawing is approved in accordance with standard operating procedures.</p>
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	<p>4.1.Drawings and or parts lists records are completed in accordance with standard operating procedures.</p> <p>4.2.Approved drawings and or parts lists are copied and issued to relevant personnel in accordance with standard operating procedures.</p> <p>4.3.Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures.</p>

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

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

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>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.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>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.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE

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 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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MEM09009C Create 2D drawings using computer aided design system

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing the CAD environment, creating 2D drawings, and producing output including linked bills of materials.
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Application of the Unit

Application of the unit	<p>This unit applies to the production of 2D drawings using a CAD system, linked bills of material, file management and associated customisation of installed software including the use of macros, menus and default settings; file formats may include IGES, DXF, HPGL.</p> <p>The unit applies to the fields of mechanical, electrical/electronic, fabrication, and fluid power. 2D drawings may be produced from 3D models created using computer aided design system.</p> <p>This unit covers CAD skills only. Where detail drafting skills are required, the following units should be considered: Unit MEM09004B (Perform electrical/electronic detail drafting), Unit MEM09005B (Perform basic engineering detail drafting), Unit MEM09006B (Perform advanced engineering detail drafting).</p> <p>Band: B</p> <p>Unit Weight: 8</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM16008A	Interact with computing technology

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare CAD environment	1.1. System variables are customised to suit standard operating procedures. 1.2. Menus are customised to suit standard operating procedures. 1.3. Drawing defaults are customised to standard operating procedures. 1.4. Macros are developed to standard operating procedures.

ELEMENT	PERFORMANCE CRITERIA
2. Create 2D drawings	2.1. Drawings are created using the full capability of the available software system. 2.2. Drawing entities are linked to database attributes to suit job requirements. 2.3. Detailed views are created using various scales to meet job requirements.
3. Produce output	3.1. Files are saved in various formats to standard operating procedures. 3.2. Linked entities are listed in a bill of materials format to meet job requirements. 3.3. Supplementary data is extracted from drawing to meet job requirements and may include area, lengths, angles and perimeters.

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 manuals, instructions and operation procedures for the CAD software and hardware being used
- where appropriate, customising the relevant system variables to suit the applicable drafting standards/procedures
- where appropriate, customising menus to suit the applicable drafting standards/procedures
- where appropriate, customising the system defaults to suit the applicable drafting standards/procedures
- where appropriate, developing macros
- creating drawings using the appropriate drawing features of the software system
- where appropriate, linking drawing entities to database attributes
- producing detailed views of the object being drawn
- printing drawing files at the appropriate scale
- saving drawing files in the appropriate format
- producing bills of material from the drawing files/database
- extracting supplementary data from the drawing file to meet job requirements

REQUIRED SKILLS AND KNOWLEDGE

- 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:

- CAD software system
- system variables that can be customised
- procedures for customising identified system variables
- reasons for customising the system variables
- applicable drafting standards/procedures
- procedures for customising menus
- reasons for customising menus
- procedures for customising system defaults
- reasons for customising system defaults
- procedures for developing macros
- reasons for developing macros
- drawing features of the CAD software system
- reasons for using specialised software features
- procedures for linking drawing entities to database attributes
- appropriate drawing scales
- procedures for printing drawing files
- procedures for creating additional views of the object being drawn
- procedures for saving drawing files
- various formats in which drawing files can be saved
- reasons for using different formats when saving drawing files
- procedures to produce bills of material
- procedures to extract data with respect to drawn shapes/features
- properties of shapes/sections/ features that can be extracted from the drawing file
- hazards and control measures associated with using computer aided design system, including housekeeping
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to create 2D drawings using computer aided design system. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with creating 2D drawings using computer aided design system or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE

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.

Drawing

Drawing	Include plans, diagrams, charts, electrical/electronic circuits
Entities	Mean any single item created on the screen and includes for example lines, arcs, circles, text, hatch and dimensions
Attributes	Mean properties associated with an entity and includes for example layer or level, line type, line width, colour and text

Entities**Attributes****Unit Sector(s)**

Unit sector	
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Co-requisite units

Co-requisite units	

Co-requisite units		

Competency field

Competency field	Drawing, drafting and design
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MEM12001B Use comparison and basic measuring devices

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers sorting items using basic comparison measuring equipment, and maintaining the equipment.
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Application of the Unit

Application of the unit	<p>Measurements are conducted in a production environment or at a work station.</p> <p>Work is undertaken autonomously or as part of teamwork. All comparative measurements are undertaken to standard operating procedures and to regulatory and legislative requirements.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use comparison and/or basic measuring devices	<p>1.1.Measuring devices are identified and used to undertake required comparisons or measurements using standard operating procedures.</p> <p>1.2.Checking or sorting of items is undertaken using comparison and/or basic measuring device according to standard operating procedures.</p>
2. Maintain comparison and/or basic measuring devices	2.1.Basic care and storage is maintained to manufacturers' standards 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

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- using device in accordance with standard operating procedures
- storing and maintaining devices
- using basic numeracy skills for undertaking comparison measurements
- following oral instructions and written standard operating procedures

Required knowledge

Look for evidence that confirms knowledge of:

- use and application of various comparison or measurement devices
- procedures for the correct use of devices
- procedures for maintaining and storing devices
- hazards and control measures associated with conducting measurements, 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 use comparison and basic measuring devices.

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

EVIDENCE GUIDE	
	<p>should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with using comparison and basic measuring devices or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Basic measuring devices	<p>Linear measuring devices measuring to within 1mm graduation - may include rules, tapes and retractable tapes</p>
Comparisons	<p>Comparison of length, angle, size, temperature, pressure, weight, voltage, resistance and amperage</p>

RANGE STATEMENT**Comparison measuring devices**

Go/no-go devices, thread angle and taper gauges, temperature gauges, pressure gauges, measuring gauges and overlay indicators, templates, digital devices and pre-set verniers and micrometers

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Measurement
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>Work is undertaken autonomously or as part of team environment. Work is undertaken in the field (in situ) or in a workshop/laboratory environment.</p> <p>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.</p> <p>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.</p> <p>Band:</p> <p>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)</p>
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	Unit Weight: 2
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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.
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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.
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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

ELEMENT	PERFORMANCE CRITERIA
	<p>used for the measurement task.</p> <p>1.3. Measurements are taken accurately to the finest graduation of instrument.</p> <p>1.4. Readings and measurements are interpreted correctly and accurately.</p>
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	<p>3.1. Measuring equipment is adjusted and maintained to required accuracy, using manufacturer or standard operating procedures and techniques.</p> <p>3.2. Equipment is stored to manufacturer specifications or standard operating procedures.</p>

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

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

EVIDENCE GUIDE	
	<p>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.</p> <p>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.</p>
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	
<p>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.</p>	
Equipment	Strip gauges, engineering squares, angle dekkors,

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	
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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.
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Application of the Unit

Application of the unit	<p>This unit covers straightforward measurement using devices which incorporate visual indications representing units of measurement.</p> <p>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.</p> <p>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.</p> <p>Work is undertaken autonomously or part of team environment, in the field, work station or workshops.</p> <p>For straightforward use of comparison or pre-set measuring devices, Unit MEM12001B (Use comparison and basic measuring devices) should be accessed.</p> <p>Band: A</p> <p>Unit Weight: 5</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

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.
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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 .

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

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,

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

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	
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>Calculations may be performed using pen and paper or on a calculator.</p> <p>Band: A</p> <p>Unit Weight: 3</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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.
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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.

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

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.

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	<p>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.</p> <p>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.</p>
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	
<p>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.</p>	
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	<ul style="list-style-type: none"> • 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	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Measurement
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MEM13003B Work safely with industrial chemicals and materials

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers using personal protective equipment (PPEs), identifying the particular hazards and emergency procedures, and observing safe working practices in that environment.
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Application of the Unit

Application of the unit	<p>This unit may be applied in a workplace in which materials and chemicals which are subject to codes and regulations are stored and used, for example, chemicals, solvents, dangerous materials, acids, noxious waste products etc.</p> <p>Evidence of competency is to encompass the satisfactory application of current State/Territory OHS legislation, standards and codes of practice, and the hierarchy of hazard control measures with elimination, substitution, isolation and engineering control measures being selected before safe work practices and PPEs.</p> <p>This unit describes the competencies which are beyond those safety requirements normally applied in the workplace as described in Unit MEM13014A (Apply principles of occupational health and safety in the work environment) or specifically described in individual units such as welding.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use personal protective equipment	1.1. Correct and appropriate safety clothing including personal protective equipment is selected and used correctly based on information in relevant material safety data sheet (MSDS).
2. Identify emergency procedures	2.1. Emergency procedures and plan relevant to the particular work environment are documented, understood and demonstrated as laid down in approved safety instructions.

ELEMENT	PERFORMANCE CRITERIA
3. Observe safe working practices	3.1. Hazardous areas and materials are identified and special handling procedures are identified and understood. 3.2. Permits to work (if necessary) are obtained. 3.3. All equipment and hazardous materials are used in accordance with relevant OHS legislation, manufacturers' instructions and standard operating procedures. 3.4. All site-specific safety policies, safety signs, symbols and labels are correctly identified and understood. 3.5. Material safety data sheets are understood and applied. 3.6. Safe manual handling procedures (including equipment) are used. 3.7. Decanted chemicals and storage is to State/Territory dangerous goods and OHS legislation and requirements. 3.8. Housekeeping duties are performed according to standard operating procedures to maintain a safe working environment.

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:

- undertaking risk assessment
- communicating with others
- performing proper manual handling techniques
- interpreting safety signage, labelling and placarding

Required knowledge

Look for evidence that confirms knowledge of:

- dangerous goods classification and labelling/placarding
- testing, use and maintenance of PPE

REQUIRED SKILLS AND KNOWLEDGE

- inherent hazardous properties of the chemicals to be used
- interpretation of the relevant MSDS
- basic fire fighting procedures
- site-specific emergency plan procedures
- chemical spill confinement procedures
- dangerous occurrence (near miss) reporting procedures
- hierarchy of control

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 work safely and efficiently with various chemicals.

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 working safely with industrial chemicals and materials or other units requiring the exercise of the skills and knowledge covered by this unit.

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.	
Personal protective equipment	Personal protective may include appropriate: <ul style="list-style-type: none"> • goggles/face shields • respirators • air supplied or self-contained helmets • safety boots, gloves and appropriate clothes/garments
Safe working practices	<ul style="list-style-type: none"> • Environment is inspected • Hazards (and chemical reactive hazards) are assessed and controlled using hierarchy of hazard control • Properly maintained PPE is available • Emergency management plan is documented/understood

RANGE STATEMENT	
	<ul style="list-style-type: none"> Work to be undertaken in safe 'thermal' environments and all possible ignition sources are to be identified and controlled
Storage	All storage containers (minor quantities and in consumer packages) are suitable for chemical exposure and are properly labelled and/or placarded. Chemical manifests are updated at completion of work activity
State or Territory legislative requirements	Appropriate OHS, dangerous goods acts and regulations, Australian standards, Australian Code for the Transport of Dangerous Goods by Road and Rail (ADGC), NOHSC codes of practice

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Occupational health and safety
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MEM13013B Work safely with ionizing radiation

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers working safely with ionizing radiation when performing radiographic testing in a range of industrial applications.
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Application of the Unit

Application of the unit	<p>This unit applies to safely working with ionizing radiation in open or closed sites: on fabrications, structures and components across a wide range of industries. It is a prerequisite to undertaking any other radiographic competency standards unit. The work can relate to scheduled and unscheduled maintenance activities, using general tools, specific radiographic testing equipment as specified in maintenance documentation, testing procedures or operator instructions.</p> <p>All testing must be completed with particular attention to personal and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - must be subject to safe work habits must be stored and used in accordance with safe work practices.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify the hazards and effects of ionizing radiation in the workplace	1.1. The source of ionizing radiation is identified in accordance with relevant organisational policy and procedures. 1.2. Production of X-rays and gamma rays is explained in relation to radiographic testing activities. 1.3. Attenuation factors of ionizing radiation and the biological effects on living tissue are outlined. 1.4. The biological effects of radiation are identified.
2. Apply radiation safety procedures/plans	2.1. Appropriate ionizing radiation protective measures are employed in accordance with relevant organisational policy and procedures.

ELEMENT	PERFORMANCE CRITERIA
	<p>2.2.SI units of radiation are explained as per the National Health and Medical Research Council/ statutory requirements.</p> <p>2.3.Exposure limits for personnel as laid down by the radiation authorities in Australia are stated and adhered to.</p> <p>2.4.Minimum exposure rates/distances are determined from calculations and charts.</p> <p>2.5.Ionizing radiation sources are operated in accordance with legislation, standards and/or organisational policy, procedures or guidelines.</p>
3. Select and use radiation monitoring equipment	<p>3.1.The tools and equipment necessary to monitor radiation are selected and used as required.</p> <p>3.2.Techniques and system verification checks necessary to monitor radiation are selected and applied.</p> <p>3.3.Safety breaches are documented and/or reported in accordance with organisational policy and procedures.</p>
4. Respond to emergency situations	4.1.Procedures for dealing with both X-ray and gamma ray emergency situations are demonstrated.

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:

- calculating and numerical operations within the scope of this unit
- reading and interpreting charts, written job instructions, specifications, standard operating procedures, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task-related operations
- checking for conformance to specifications
- using monitoring equipment
- calculating and monitoring radiation

REQUIRED SKILLS AND KNOWLEDGE

- handling emergencies
- following safety requirements
- assessing risk

Required knowledge

Look for evidence that confirms knowledge of:

- properties of X-rays and gamma rays and principal radioactive sources used in industrial radiography
- attenuation factors
- known biological effects of radiation
- general principles of gas ionisation, photographic effect, luminescence
- use of film, film badges, ionisation chamber devices, quartz fibre, fluorescent, electronic devices accuracy limits (energy/range)
- different SI units of radiation including becquerel, sievert and gray
- exposure limits for personnel as laid down by the radiation authorities in Australia
- the three exposure reduction factors including: time, distance and shielding
- procedures for establishing safe working barriers
- relevant techniques and checks
- emergency procedures
- safety procedures including for:
 - types of X-ray equipment
 - types of isotope cameras
 - shielding materials
 - design and requirements for exposure areas
 - requirements for storage of radioisotopes
- emergency situations, causes and appropriate responses
- hazards and control measures associated with ionizing radiation, including housekeeping
- storage requirements of equipment and materials
- use and application of personal protective equipment
- safe workplace practices and procedures
- legal requirements including;
 - Australian/NSW regulations, code of practice (detail)
 - ICRP recommended limits for various persons and various parts of the body for short-term, long-term and accumulated exposure
 - background radiation
 - duties of RSO
 - requirements for transport
 - IATA regulations

REQUIRED SKILLS AND KNOWLEDGE

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| <ul style="list-style-type: none"> obligations of the licensee |
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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 safely work with ionizing radiation when performing radiographic testing.

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 radiographic testing 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

EVIDENCE GUIDE	
	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	
<p>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.</p>	
Relevant organisational policy and procedures	<ul style="list-style-type: none"> • Legislation • Standard operating procedures (SOPs) • Australian or international standards • Risk assessments • Previous testing reports • Manufacturer specifications
Production of X-rays and gamma rays	<ul style="list-style-type: none"> • Atomic structure, protons, neutrons, electrons, atomic number, mass number, isotopes • Electromagnetic radiation wavelength, frequency, energy relationships, intensity • Construction and operation of X-ray tube anode, cathode, target • Gas and coolidge tubes • Glass and ceramic tubes • X-ray spectrum • Characteristic and continuous spectra effect of voltage and current on continuous spectra • Efficiency • Natural and artificial radioisotopes • Production of radioisotopes

RANGE STATEMENT	
	<ul style="list-style-type: none"> Decay mechanisms, alpha, beta-, beta+, and gamma Concept of half life, decay constants Selection of gamma ray sources Units definition of curie, becquerel, conversion of units, multiple units (e.g. GBq), nuclide chart
Biological effects of radiation	<ul style="list-style-type: none"> Ionisation, absorption, scatter (Compton, Rayleigh, photo-electric, pair production) Attenuation coefficient, absorption edges Units roentgen, rad, coulomb/kg, gray conversions Effects of varying doses on living tissue Somatic effects, genetic effects, cell biology nucleus, cytoplasm DNA, chromosome, mitosis; symptoms, effect of time, ICRP recommendations Dose, dose equivalent, RBE, rem, seivert, conversions Occupancy factor
Protective measures	<ul style="list-style-type: none"> Personal protective equipment (PPE) including for risks other than ionizing radiation Safety protocols of workplace (e.g. flame limitations in refineries) Signage, barriers/guards Limitations on operation of specific equipment/machines
Minimum exposure	<ul style="list-style-type: none"> Time, distance, shielding effect of distance, inverse square law Half and tenth value layers Emergency procedures, company procedure codes

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Occupational health and safety
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MEM15004B Perform inspection

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers inspecting products, keeping records and providing feedback on the conformance of product to specifications.
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Application of the Unit

Application of the unit	<p>This unit applies to basic inspection of completed or partly completed products produced by others. Inspection is carried out according to a site quality plan or specifications; it applies to a range of manufacturing enterprises; and requires application of a range of measuring equipment/devices/tools.</p> <p>Location and frequency of checks/tests and measurements are undertaken to standard operating procedures. In general, verification should be made as close as possible to the point of production of the feature or characteristic. Inspection may involve 'first piece inspection', fixed interval, sample etc. Depending on the inspection process, other technical units may need to be accessed, for example, appropriate measurement units.</p> <p>This unit is not intended to be applied to maintenance personnel carrying out their day-to-day activities, for example, fault finding, remedial and checking activities. These skills are covered by other units such as Unit MEM18006C (Repair and fit engineering components).</p> <p>This unit should not be selected for the purposes of non destructive testing, where Unit MEM24002B (Perform penetrant testing), Unit MEM24004B (Perform magnetic particle testing), Unit MEM24006B (Perform eddy current testing), Unit MEM24008B (Perform ultrasonic testing) or Unit MEM24010B (Perform radiographic testing) have already been selected.</p>
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	Band: A Unit Weight: 2
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
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ELEMENT	PERFORMANCE CRITERIA
1. Inspect products	1.1.Products are tested for conformance to specifications in accordance with standard operating procedures.
2. Keep records	2.1.Test status identification is made on conforming and non-conforming products and records are accurately kept using standard operating procedures.
3. Provide feedback	3.1.Products are tested/inspected/measured after rework or repair. 3.2.Deficiencies or deviations are reported 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:

- reading, interpreting and following information on written job instructions, standard operating procedures and other applicable reference documents
- testing products for conformance to specifications in accordance with job instructions
- testing reworked/repared products for conformance to specification, in accordance with job instructions
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- the procedures as defined by job instructions to be used to check conformance to specifications
- the data to be recorded and the frequency of recording required
- the consequences of not keeping accurate records
- non-conformances of given products that can be removed by rework/repair in accordance with job instructions
- hazards and control measures associated with performing basic inspection activities
- use and application of personal protective equipment
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform inspection (basic).
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	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing inspection (basic) or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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,

EVIDENCE GUIDE	
	standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Tested for conformance to specifications	Visual inspection, physical measurements, chemical tests, checks against patterns, templates and guides etc.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Quality
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MEM15010B Perform laboratory procedures

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers working under laboratory conditions, performing calibration of equipment and writing reports on the results.
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Application of the Unit

Application of the unit	<p>This unit applies to the use of a range of sophisticated equipment that provides independent feedback on quality processes and procedures.</p> <p>Individuals are likely to be working autonomously and following scientific procedures under controlled conditions. All work would be carried out to predetermined standard operating procedures.</p> <p>This unit would be taken in conjunction with appropriate technical units.</p> <p>Band: B</p> <p>Unit Weight: 8</p>
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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.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Work under laboratory conditions	1.1.Independent tests are conducted under controlled conditions.
2. Perform calibration	2.1.Equipment is verified and calibrated to agreed quality standards. 2.2.Calibration status is safeguarded against unauthorised adjustment. 2.3.Accurate records are kept for reference purposes. 2.4.Test equipment is periodically recalled for adjustment, repair and re-calibration. 2.5.Documentary evidence is maintained, covering identification of equipment; frequency of re-calibration; calibration status and procedures for recall, handling and storage, adjustment, repair,

ELEMENT	PERFORMANCE CRITERIA
	<p>calibration, installation and use.</p> <p>2.6. Calibration to reference standards of known accuracy such as national or international standards is traced, or where these do not exist, is set to specifically developed criteria.</p>

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, reading and interpreting relevant drawings, circuits, specifications, instructions and data in accordance with standard operating procedures
- planning and sequencing operations
- checking and clarifying task-related operations
- using calculations and numerical operations within the scope of this unit
- conducting independent tests under controlled conditions
- checking measuring equipment for correct calibration against the agreed quality standards
- safeguarding the calibration status of the equipment against unauthorised adjustment
- completing and maintaining records of measuring equipment calibrated
- recalling test equipment for adjustment, repair and re-calibration
- using reference standards or specific criteria as the basis for calibration.
- documenting test results
- preparing reports on the tests carried out
- conducting inspections, tests and audits in accordance with standard
- using results of inspections, tests and audits to inform the design and service

Required knowledge

Look for evidence that confirms knowledge of:

- the tests to be undertaken
- the conditions under which the tests are to be undertaken
- the testing procedures to be followed
- the reasons for conducting tests under controlled conditions

REQUIRED SKILLS AND KNOWLEDGE

- the need for tests to be conducted independently
- the quality standards against which the measuring equipment is to be calibrated
- the correct operation of the measuring equipment
- the specifications of the measuring equipment
- the tools and equipment required to check the calibration of the measuring equipment
- the procedures for checking the calibration of the measuring equipment
- any codes, standards, legislative or regulatory requirements applicable to the measuring equipment and/or calibration
- the procedures for preventing unauthorised adjustment of equipment
- the reasons for protecting equipment against unauthorised adjustment
- the records to be kept with respect to the calibration of measuring equipment
- the reasons for keeping accurate calibration records
- the procedures for recalling test equipment for adjustment, repair and re-calibration
- the frequency of test equipment recall
- the reasons test equipment may be recalled
- all relevant documentation relating to the calibration/re-calibration of test equipment
- the procedures for completing the relevant documentation
- sources of reference standards and procedures to be used in the absence of reference standards
- the reports to be prepared/provided with respect to the test equipment being tested
- the procedures for preparing/ providing reports on tests carried out on test equipment
- the auditing processes to be applied to testing procedures
- the use of information from the inspections, tests and audits conducted in the development of design and servicing of products/equipment
- hazards and control measures associated with performing laboratory procedures, 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.

EVIDENCE GUIDE	
Overview of assessment	A person who demonstrates competency in this unit must be able to perform laboratory 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 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	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing laboratory procedures or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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.

Tests	<p>Tests will be conducted to a standard method and may be:</p> <ul style="list-style-type: none"> • mechanical tests such as for hardness, tensile and impact • electrical tests such as for resistance, capacitance and inductance • semiconductor or other electronic tests
Calibration	<p>Calibration refers to those calibrations which are conducted to a specified standard using equipment available in the workplace/laboratory. It may include the testing of known standard samples</p>
Test equipment	<p>May be mechanical, electrical or electronic or some combination</p>
Documentary evidence	<p>Documentary evidence of calibration will be sufficient to satisfy the needs the certifying body (e.g. NATA) or as otherwise specified in the calibration standard or in accordance with manufacturers' recommendation</p>
Documented	<p>Documentation of test/calibration results will conform to good laboratory practice and will allow for the verification of results and for a historical record of results such as might be required for verification of results, quality audits and legal inquiries.</p>

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Quality
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MEM15017B Use and maintain reference standards

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	The unit covers caring for and maintaining reference standards and test equipment used to undertake trade measurement activities.
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Application of the Unit

Application of the unit	<p>This unit is designed for those performing trade measurement inspection/certification activities in public or private enterprises.</p> <p>This unit may be applied in relation to inspection of pre-packed articles, examining trading practices, auditing servicing licensees, investigating consumer complaints, performing verification/certification and in-service inspection.</p> <p>Reference material relevant to this competency includes Australian standards, handbook of verifying authority, manufacturers' operating manuals, organisational procedures and quality assured manual.</p> <p>Workplace and health and safety considerations include storage and transportation of test equipment, handling of test equipment, handling of hazardous materials, safety clothing, manual handling techniques and site/premises conditions.</p> <p>Band: B</p> <p>Unit Weight: 3</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM11011B	Undertake manual handling
	MEM12003B	Perform precision mechanical measurement
	MEM12004B	Perform precision electrical/electronic measurement
	MEM12005B	Calibrate measuring equipment
	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify the appropriate class of reference standard suitable to verify a range of trade measuring instruments	<p>1.1.Tolerances required for reference standards are researched in relation to testing a range of trade measuring instruments and legislation.</p> <p>1.2.The correct classes of reference standards are selected to test a range of trade measuring instruments.</p>
2. Use reference standards and test equipment in a safe and metrologically sound manner	<p>2.1.Standards Laboratory purpose and function are explained.</p> <p>2.2.An operational assessment on reference standards and test equipment is performed prior to use.</p> <p>2.3.Documented operating policies and procedures for reference standards and test equipment are accessed and followed.</p> <p>2.4.Safety requirements for the use of reference standards and test equipment within the work environment are demonstrated.</p>
3. Store and transport reference standards and test equipment to maintain their integrity	<p>3.1.Specialised equipment and reference standards are stored in accordance with organisational procedures.</p> <p>3.2.Specialised equipment and reference standards are transported in accordance with organisational procedures.</p>
4. Perform required maintenance of reference standards and test equipment	<p>4.1.Maintenance requirements of reference standards and test equipment are identified.</p> <p>4.2.Regular maintenance of reference standards and test equipment is undertaken in accordance with maintenance register.</p> <p>4.3.Defective reference standards and test equipment are identified and reported for repair.</p>
5. Interpret documentation relating to the use of maintenance of reference standards and test equipment	<p>5.1.Information contained in the certificate of verification is checked and compared with reference standards and test equipment being used.</p> <p>5.2.Reference standards are used in accordance with documented instructions and certificates.</p>

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:

- accessing correct reference manuals for appropriate information concerning tolerances for reference standards
- identifying correct class of reference standard and matching with the appropriate trade measuring instrument
- accessing documented operating procedures for reference standards and test equipment
- using reference standards and test equipment
- calibrating/maintaining reference standards and test equipment
- maintaining maintenance register
- identifying and recording/reporting malfunction of or damage to reference standards or test equipment
- interpreting certificates of verification in relation to the use of reference standards
- using graphs and tables within certificates

Required knowledge

Look for evidence that confirms knowledge of:

- definition of 'legal metrology'
- the hierarchy of reference standards in relation to legal metrology
- Australian legal units of measurement used for trade
- the organisations involved in legal metrology in Australia
- application of different classes of reference standards used to test measuring instruments
- maintenance requirements for reference standards and test equipment
- major function and purpose of the Standards Laboratory
- the actions to be taken if reference standards and test equipment are found to be defective
- test equipment and reference standards storage specifications and procedures
- personal responsibility for workplace, health and safety requirements
- specialised equipment, reference standards and transport specifications and procedures
- transport specifications and procedures
- variations from storage specifications and procedures requiring appropriate approval
- variations from transport specifications and procedures requiring appropriate approval

REQUIRED SKILLS AND KNOWLEDGE

- maintenance required for test equipment where manufacturers' requirements are unavailable
- a range of maintenance and calibration procedures
- procedure for reporting faults
- action to be taken where legal traceability can not be confirmed
- the purpose of certificates of verification issued under the national legislation
- information in graphs and tables within certificates
- workplace, health and safety requirements relating to reference standards and test 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 use and maintain reference standards. 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

EVIDENCE GUIDE	
	with using and maintaining reference standards, 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.	
Reference standards	Mass, volume, density, area, length, master meters, temperature
Legislation	Enabling legislation, workplace, health and safety, environmental legislation
Operating policies and procedures	Manufacturers' specifications, industry guidelines, Australian standards, legislation, organisational procedures and guidelines
Specialised equipment	Reference standards, measuring devices, safety equipment

RANGE STATEMENT

Maintenance requirements of reference standards and test equipment

Cleaning and painting, electrical safety testing and tagging, continuity and pressure testing, manufacturers' service requirements

Unit Sector(s)

Unit sector

Co-requisite units

Co-requisite units

Competency field

Competency field

Quality

MEM16002C Conduct formal interviews and negotiations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers planning and conducting interviews, participating in interviews and taking part in negotiations.
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Application of the Unit

Application of the unit	<p>This unit applies to effective communication in more formal on-site or small group situations where ideas are defined and specific outcomes are sought. The topics covered are often formally identified and records may be kept. Interviews could include job recruitment and progression, performance reviews, grievance, etc.</p> <p>This unit does not cover the skills needed for participation in formal group processes such as meetings which are covered by Unit MEM16001B (Give formal presentations and take part in meetings).</p> <p>For interviews associated with training and assessment, refer to the appropriate units.</p> <p>Band: A</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and conduct interviews	1.1. Interview is planned and initiated to achieve a specified purpose. 1.2. Suitable questions appropriate to the purpose are used. 1.3. Discretion and confidentiality are exercised where appropriate.
2. Participate in interviews	2.1. Appropriate preparation is undertaken. 2.2. Active listening skills are employed. 2.3. Self-presentation is applied appropriate to the purpose. 2.4. Questions are asked where appropriate. 2.5. Follow-up activities are clarified and reported in accordance with standard operating procedure.
3. Take part in negotiations	3.1. Language appropriate to the other party is used.

ELEMENT	PERFORMANCE CRITERIA
	3.2. Own and others' needs/wants are stated and clarified. 3.3. The views of fellow employees, including own group or team, are represented to others. 3.4. The appropriate communication medium is selected. 3.5. Follow-up activities are clarified and reported 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:

- planning and formatting interviews
- developing open and closed interview questions to gain required information
- building rapport
- maintaining discretion and confidentiality
- preparing for interviews
- using active listening skills
- identifying interview goals
- identifying selection/assessment criteria
- clarifying follow-up activities
- reporting follow-up activities
- using appropriate language to the other party(s)
- clarifying needs/wants of others
- representing the views of fellow team or group members during negotiations
- selecting appropriate communication media during the negotiations

Required knowledge

Look for evidence that confirms knowledge of:

- the purpose of the interview
- the assessment criteria for the interview
- the procedures to be followed in planning and conducting the interview
- the detail/information to be obtained from the interview
- questions appropriate to the detail/information to be obtained

REQUIRED SKILLS AND KNOWLEDGE

- active listening techniques that can be applied in interview situations
- the effect(s) of the individual's presentation during the interview upon the interview
- the effect(s) of the timing of questions on the interviewee
- the need to follow-up issues raised during the interview and negotiations
- the procedures for reporting the outcomes of follow-up activities
- the parties to be involved in the negotiations
- the reasons for using appropriate language
- the reasons for maintaining confidentiality
- the reasons for clarifying the needs/wants of others
- the needs/wants of the individual
- the views of fellow team or group members
- a range of communication media
- the appropriate communication medium
- safe workplace practices

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 conduct formal interviews and negotiations.
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

EVIDENCE GUIDE	
	<p>should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with conducting formal interviews and negotiations or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Preparation	<ul style="list-style-type: none"> • Identifying and inviting co-interviewers • Planning interview • Preparation of interview room • Accessing required documents and materials • Introductions and explanations
Active listening skills	<ul style="list-style-type: none"> • Appropriate body language

RANGE STATEMENT	
	<ul style="list-style-type: none"> • Acknowledgements • Clarification questions • Appropriate responses
Communication medium	<ul style="list-style-type: none"> • Face-to-face meeting • Telephone • Email • Written • Advocacy

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Communication
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MEM16006A Organise and communicate information

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers accessing, organising and communicating information related to processes or tasks.
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Application of the Unit

Application of the unit	<p>This unit applies in manufacturing, engineering or related environments.</p> <p>It may include information related to production, maintenance or associated processes. Information may be drawn from a variety of sources.</p> <p>This unit includes the ability to communicate using common workplace terminology.</p> <p>For access and recording of data requiring system knowledge and judgement, see Unit MEM16008A (Interact with computing technology).</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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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.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Access information and/or records	1.1.Information requirements of tasks are determined and relevant information is accessed from a range of sources. 1.2.Workplace terminology is correctly recognised.
2. Organise and analyse information	2.1.Information is interpreted and organised in accordance with enterprise and work requirements. 2.2.Information is analysed according to enterprise and work requirements.
3. Communicate organised information using established workplace methods	3.1.Information is communicated using established workplace methods.

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:

- accessing relevant information from a range of sources
- recording, where appropriate, the accessed information
- recognising and using workplace terms
- reading, interpreting and following information in workplace documentation
- checking and clarifying information
- organising, categorising and sequencing information

Required knowledge

Look for evidence that confirms knowledge of:

- types of information
- available sources of information
- information analysis techniques
- methods of categorising and organising information
- methods of recording and communicating information

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 organise, analyse and communicate information.

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

EVIDENCE GUIDE	
	in new and different situations and contexts.
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with organising, analysing and communicating information or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Range of sources	Job instructions, specifications, standard operating procedures, charts, lists, documents, computer data, drawings, sketches, tables, technical manuals and/or charts and other applicable reference material
Workplace terminology	Terminology - referring to equipment, processes, workplace areas, staff and procedures - specific to the processes and equipment used in the workplace
Analyse	Analysis for this unit involves simple determinations of relevance and implication for the employee's immediate work requirements
Established workplace methods	<ul style="list-style-type: none"> • Proforma reports • Data entry e.g. bar coding and simple keyboard operations • Verbal • Drawings

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Communication
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MEM16008A Interact with computing technology

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers accessing, inputting and storing information used in manufacturing, engineering or related environments, using computing technology.
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Application of the Unit

Application of the unit	<p>This unit applies in manufacturing, engineering or related environments. It involves identifying the type and source of information required, and using the technology to access, input and store information. The equipment may include computers and a range of other equipment based on computing technology.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine job requirements	1.1. Nature and scope of task requirement are identified. 1.2. Information/data required to be accessed, input or stored is identified. 1.3. Source of information/data is identified.
2. Access information/data	2.1. Access procedures are followed. 2.2. Technology is navigated to find the required information/data. 2.3. Relevant software application menus, functions and commands are used to locate required information/data. 2.4. Information/data is retrieved using organisational procedures. 2.5. Information/data is checked for relevance to job requirements.
3. Input information/data	3.1. Relevant software menus, functions and commands are used to manipulate information/data. 3.2. Information/data is entered, changed, or removed as required.
4. Store	4.1. Data/files are saved following standard procedures

ELEMENT	PERFORMANCE CRITERIA
information/data	<p>prior to exiting the application.</p> <p>4.2.Data output is produced as required.</p> <p>4.3.Procedures for shutting down/logging off/exiting computing technology are followed.</p>
5. Access assistance as required	<p>5.1.Appropriate personnel are identified and consulted as required.</p> <p>5.2.Manuals, online help and other reference materials are identified and used as required.</p>

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:

- ability to enter or retrieve data using appropriate software applications
- 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
- using numerical operations within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- functions and capabilities of various types of computing technology used in the workplace
- functions of software applications
- hazards and control measures associated with using computing technology, including housekeeping
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	<p>A person who demonstrates competency in this unit must be able to interact with computing technology to achieve workplace outcomes.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p>
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with interacting with computing technology or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for	

EVIDENCE GUIDE	
assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Access procedures	Logging on and security procedures, virus checks, start-up routines, application start-up
Technology	Hand held data recording devices, screen based equipment, personal computers, bar coders
Applications	<ul style="list-style-type: none"> • Word processing spreadsheets and databases • Customised engineering and manufacturing applications • Material Resource Planning (MRP) • Warehousing inventory applications • Predictive reliability and maintenance applications • Production data management applications
Data output	Report, email, chart, graph, printout, data transfer, labels

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Communication
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MEM16010A Write reports

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers writing technical or non-technical reports that include some level of analysis and/or research.
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Application of the Unit

Application of the unit	<p>The term report is used to denote any required written communication that goes beyond a simple recording of facts (such as completion of a pro forma shift production schedule) and which is based on a level of analysis and/or research.</p> <p>Where reports include technical information or details, then the writer would have the required technical knowledge/capability.</p> <p>Conclusions and/or recommendations where required are based on prior research or analysis of data. The analysis and conclusions should be consistent with the level of skill and knowledge of an employee working at that level. Simple analysis and research would be required.</p> <p>If data research and analysis is necessary to produce information for the report, Unit MEM16009A (Research and analyse engineering information should also be selected).</p> <p>For preparation of simple technical reports, see unit MEM16014A (Report technical information).</p> <p>Band: B</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM14005A	Plan a complete activity

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify report requirements	1.1. Requirements for a written report are identified and confirmed with appropriate persons. 1.2. Information for the report is accessed according to workplace procedures. 1.3. Information is assessed for currency, accuracy and relevance for inclusion in the report.
2. Prepare and produce report	2.1. A structure and outline of the report are developed according to identified report requirements.

ELEMENT	PERFORMANCE CRITERIA
	<p>2.2. The report is written using terminology appropriate to the reader and established principles of report writing.</p> <p>2.3. Findings and conclusions are based on factual analysis.</p> <p>2.4. Recommendations, alternatives/suggestions are given, and supporting evidence supplied, where required.</p> <p>2.5. Protocols, conventions and legal requirements related to acknowledgements and intellectual property are applied where necessary.</p>
3. Finalise and distribute report	<p>3.1. The report is checked for accuracy and edited as required.</p> <p>3.2. The completed report is consistent with objectives and requirements.</p> <p>3.3. The report is copied, distributed and stored according to instructions and workplace procedures.</p>

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
- following instructions
- checking and clarifying information
- sorting information/data
- assessing information/data for relevance
- using terminology and language appropriate to the target audience
- structuring and writing reports
- applying principles of report writing
- presenting findings and conclusions based on factual analysis
- making recommendations

REQUIRED SKILLS AND KNOWLEDGE

- managing own time
- planning and sequencing information
- reviewing and editing

Required knowledge

Look for evidence that confirms knowledge of:

- principles of report writing
- report types and purposes
- structure, style and parts of a report
- use of language and expression in reports
- common pitfalls, such as ambiguity, truisms, tautology, verbosity, circumlocution etc.
- report numbering systems
- techniques for reviewing and editing
- importance and benefits of preparing reports appropriate for the intended audience
- referencing and the importance of acknowledging sources
- 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 write reports. 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

EVIDENCE GUIDE	
	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with writing reports or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Requirements	<p>Purpose, expected outcomes, scope and nature, timeframe, required resources</p>
Report	<ul style="list-style-type: none"> • Reports types:

RANGE STATEMENT

	<ul style="list-style-type: none"> • accident/injury • equipment report • memo and letter reports • information report • analytical report • Report structure: <ul style="list-style-type: none"> • title page • table of contents • summary • introduction • body (findings and conclusions) • recommendations • references • appendices • glossary • Report content: <ul style="list-style-type: none"> • text • graphs • charts • tables • diagrams
Principles of report writing	<ul style="list-style-type: none"> • Use of headings, subheadings, sectioning and numbering • Objectivity • Expression • Language and grammar • Sentence and paragraph structure • Logical ordering and sequencing • Summarising and editing • Layout and spacing • Content relevancy • Use of graphics, charts, tables, illustrations etc.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Communication
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MEM17002B Conduct workplace assessment

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers identifying, planning and carrying out assessment; recording the results; and reviewing the procedure. Methods of assessment may include observation, documentation, demonstration, projects, oral tests, computer based assessment, written tests, etc.
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Application of the Unit

Application of the unit	<p>Appropriate assessment techniques will be selected based on assessor knowledge of the competency to be assessed or in conjunction with someone who is competent (technical expert). Assessment may be undertaken on an individual basis or in groups. This unit is intended to equate to national competency standards Assessment Standard Unit: Conduct assessment to an established procedure, and the Extension Unit: Plan and review assessment. This competency also meets the assessment skills required to be recognised by Manufacturing Skills Australia as a workplace assessor.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify and plan assessment requirements	<p>1.1. Area and purpose of assessment are identified in consultation with appropriate personnel and person/s being assessed.</p> <p>1.2. Appropriate competency standard/s and assessment guides are identified and selected as required.</p> <p>1.3. Evidence required to establish competency is determined according to industry and enterprise assessment procedure.</p> <p>1.4. Evidence required and assessment arrangements are discussed and confirmed in an appropriate way with person being assessed.</p>
2. Carry out assessment	2.1. Agreed assessment procedure is implemented in a

ELEMENT	PERFORMANCE CRITERIA
	<p>manner, time and location to maximise active participation from assessment candidate/s.</p> <p>2.2.Evidence consistent with the agreed assessment procedure is gathered using appropriate and specified methods and tools, and is documented according to agreed industry or site procedures.</p> <p>2.3.Evaluation and assessment decisions are made according to agreed assessment procedures.</p> <p>2.4.Clear and appropriate feedback is provided to person/s assessed.</p> <p>2.5.Advice is provided to assessment candidate/s on training needs, appeal mechanisms, as appropriate.</p>
3. Record results and review the procedure	<p>3.1.Assessment results are recorded according to industry or site procedures.</p> <p>3.2.Records are kept/stored in a manner appropriate to maintenance of confidentiality and safety.</p> <p>3.3.Assessment procedure are reviewed in cooperation with person being assessed and revised, if appropriate.</p>

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 relevant competency standards and assessment guides
- discussing and confirming evidence required and the assessment arrangements
- performing assessments
- gathering and documenting evidence
- evaluating evidence and making assessment decisions
- providing clear and appropriate feedback
- advising on training needs and/or the appeals procedures
- recording assessment results
- storing records
- reviewing and revising the assessment procedure

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Look for evidence that confirms knowledge of:

- area and purpose of the assessment
- persons to be consulted when determining the assessments to be carried out
- relevant competencies
- evidence required to establish competency
- reasons for identifying the evidence to be obtained
- industry assessment procedure
- reasons for discussing and confirming the assessment arrangements with the assessment candidate
- time and location of the assessment
- reasons for selecting the time/location for the assessment
- methods of gathering the evidence
- reasons for using the selected methods of obtaining evidence
- procedures for documenting the assessment
- procedures for evaluating the gathered evidence
- need to provide clear and positive feedback to the assessment candidate
- appeals procedure
- any further training required by the assessment candidate
- procedures for recording assessment results
- need to keep records securely stored
- procedures for storing assessment records
- procedures for reviewing assessments undertaken
- reasons for evaluating assessment methods/procedures
- procedures for revising assessment 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 conduct workplace assessment.

Critical aspects for assessment and

Assessors must be satisfied that the candidate can

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	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with conducting workplace assessment or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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

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.

Purpose of assessment	Recognition of prior learning, determination of award classification level or identification of training needed
Evidence required	Should address task skills, task management, contingency management application
Assessment procedure	Observation, documentation, demonstration, projects, oral tests, computer based assessment, written tests
Appropriate and specified methods and tools	Should address issues such as clarity, reliability, validity of results, fairness in assessment application, and cost effectiveness of process

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Training
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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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>When using hand held power tools or power tools used for hand held operations, refer to Unit MEM18002B (Use power tools/hand held operations).</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use hand tools	<p>1.1. Hand tools are selected appropriate to the task requirements.</p> <p>1.2. Hand tools are used to produce desired outcomes to job specifications which may include finish, tension, size or shape.</p> <p>1.3. All safety requirements are adhered to before, during and after use.</p> <p>1.4. Unsafe or faulty tools are identified and marked for repair according to designated procedures before, during and after use.</p> <p>1.5. Routine maintenance of tools, including hand sharpening is undertaken according to standard</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>operational procedures, principles and techniques.</p> <p>1.6. Hand tools are stored safely in appropriate location according to standard operational procedures and manufacturers' recommendations.</p>

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

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	<p>A person who demonstrates competency in this unit must be able to use hand tools for a range of general engineering applications.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p>
Context of and specific resources for assessment	<p>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.</p> <p>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.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
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	
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Co-requisite units

Co-requisite units	

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.
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Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>For using hand tools, see Unit MEM18001C (Use hand tools).</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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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.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use power tools	<p>1.1. Power tools are selected appropriate to the task requirements.</p> <p>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.</p> <p>1.3. All safety requirements are adhered to before, during and after use.</p> <p>1.4. Unsafe or faulty tools are identified and marked for repair before, during and after use according to designated procedures.</p> <p>1.5. Operational maintenance of tools, including hand sharpening, is undertaken according to standard</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>workplace procedures, principles and techniques.</p> <p>1.6. Power tools are stored safely in appropriate location according to standard workshop procedures and manufacturers' recommendations.</p>

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

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
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	<p>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.</p> <p>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.</p>
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.

EVIDENCE GUIDE

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.

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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MEM22013A Coordinate engineering projects

Modification History

Release 1 - New unit. Replaces MEM22004A, but not equivalent.

Unit Descriptor

This unit of competency covers the coordination of engineering projects within project plans and budgets. It includes monitoring and maintaining the project implementation plan, performance analysis and use of project management software.

Application of the Unit

This unit applies to people with significant coordination and facilitation responsibilities for engineering or related projects. The projects will usually have fixed term or purpose and involve specific engineering-related tasks, such as installation and commissioning of plant, design of equipment or major overhauls.

The coordination role covered by the unit includes monitoring of engineering and other technical performance parameters against the project plan as well as monitoring of other project parameters that impact on engineering and technical compliance of the project. These include finance, accounting, budgeting and control, resourcing, tenders, contracts, work health and safety (WHS), risk management, human resources, and legal and regulatory requirements.

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 Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used,

a unit of competency. 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

1	Review and confirm parameters of delegated project	<p>1.1 Review designs, drawings, standards and established implementation plan and schedule to establish scope of the engineering project</p> <p>1.2 Review budget and control measures for delegated project</p> <p>1.3 Review project management structure, functional team relationships, communications and reporting lines</p> <p>1.4 Review materials, logistics and services procurement requirements</p> <p>1.5 Review the need for appropriate technical and professional assistance</p> <p>1.6 Review physical resources requirements</p> <p>1.7 Review human resources and skills development requirements</p> <p>1.8 Review compliance requirements for project, including WHS requirements, codes of practice, regulations, standards, legal and other regulatory requirements, and enterprise procedures</p>
2	Coordinate implementation of delegated project	<p>2.1 Assign and obtain team agreement to plans, communication arrangements, responsibilities, schedules and requirements</p> <p>2.2 Establish liaison arrangements with other functional groups</p> <p>2.3 Ensure efficient and documented arrangements for requests for further information (RFIs) from designers and other experts</p> <p>2.4 Confirm internal and external reporting requirements,</p>

- including content, schedule and sign-off arrangements
- 2.5 Confirm suppliers, contractors and delivery schedules, and any installation requirements
 - 2.6 Coordinate actions to overcome constraints and contingencies, including coordination with stakeholders and adjustments, if necessary, to plans and schedules
 - 2.7 Coordinate and monitor specialist and technical support services to meet schedules, budgets and performance requirements
 - 2.8 Maintain and monitor records of project tasks for accountability against objectives, schedule and budget
 - 2.9 Apply principles of continuous improvement to implementation
 - 2.10 Implement project management, resources control and budgeting software, when required
- 3 Report on outcomes
 - 3.1 Record progress in accordance with procedures
 - 3.2 Supervise the completion of project, including sign-off and completion of required documentation of the project

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- coordinating technically complex engineering-related projects
- project management skills, including using resources control and budgeting software, as required
- reviewing, confirming and establishing parameters for project objectives, project plan, budget and scheduling related to tasks
- communicating, negotiating and reviewing with stakeholders throughout project duration
- coordinating and monitoring task schedules and resources; addressing contingencies and constraints, continuous improvement, problem solving and decision making; and adjusting short-term planning and rescheduling, as necessary

- implementing systems thinking and concurrent engineering, as appropriate
- project planning and scheduling, including:
 - working within or establishing a project management structure
 - establishing functional team relationships, communications and reporting lines
 - ensuring compliance with business plans, financial objectives, budgets and customer brief
 - incorporating WHS and other regulatory requirements
- establishing accountabilities and responsibilities (including recording and reporting) for:
 - scheduling and implementation of project tasks
 - physical and financial resources and budget
 - the use of professional services and contractors
 - maintaining records of trades and industry contacts and sources of expert advice
 - records of procedures and regulatory compliance
 - personal and team skills development
 - maintaining task schedules, Gantt charts and other planning tools and resources
 - procedures for addressing contingencies and constraints, continuous improvement, problem solving and decision making, and adjusting short-term planning and rescheduling as necessary
 - organisational procedures for compliance with WHS, codes of practice, and other legislative requirements, environmental and social obligations, and ethical practice
 - risk management procedures

Required knowledge

Required knowledge includes:

- engineering and technology knowledge appropriate to the project
- context of project, including:
 - customer-supplier relationships
 - regulatory requirements and environment
 - materials resourcing and labour and skills supply arrangements
 - market and competitive environment
- human resources and skills development procedures and options for skill needs typical of engineering projects
- typical budget and control measures for engineering-related projects, including:
 - audit
 - tenders
 - contracts
 - schedules
 - budget categories and items:
 - personnel
 - materials

- equipment procurement and maintenance
- contractors
- logistics
- security
- requirements for and functions of technical documentation, graphics and specifications, meeting procedures, records and minute taking
- WHS Acts and regulations relevant to engineering projects
- risk management procedures, isolation and notification procedures in the event of irregularities or accident
- systems thinking, contingency and constraints management
- conflict resolution, problem solving and decision making

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 coordinate an engineering project This includes working individually and as part of a team and recognising and complying with normal control procedures on engineering projects.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently: <ul style="list-style-type: none"> • review, confirm and establish project objectives, plans and schedules • identify technical and engineering requirements of project from drawings, customer briefs, contracts and other appropriate sources • identify and manage stakeholders, including customers, suppliers, contractors and regulatory agencies • manage for contingencies and non-conformances • cooperate, communicate and negotiate effectively with stakeholders.
Context of and specific resources for assessment	<ul style="list-style-type: none"> • 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, then a simulated working environment 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. • Where applicable, reasonable adjustment must be made to

	<p>work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <ul style="list-style-type: none"> • Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure correct interpretation and application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • 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. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

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.

Personal responsibilities	<p>Personal responsibilities within the project may be defined by:</p> <ul style="list-style-type: none"> • role specification and delegations • workplace agreement or Award • negotiation with clients and/or supervisors • contracts • legal or regulatory obligations
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	<ul style="list-style-type: none"> • professional and ethical considerations • agreed operational or project requirements
Systems thinking	<p>Systems thinking refers to the conduct of engineering work in a manner that demonstrates knowledge of how the interaction of different technical systems on equipment, machinery or structures, as well as the skills and techniques of personnel, combine to perform or support engineering-related operations, processes or projects. It embraces determining or establishing how the function of each technical system or component, as well as the skills and techniques of personnel, effects or potentially may effect, outcomes. Systems should be interpreted broadly within the context of the organisation and depending on the project or operation can include equipment, related facilities, material, software, internal services and personnel, and other organisations in the value chain</p>
WHS, regulatory requirements and enterprise procedures	<p>WHS, regulatory requirements and enterprise procedures may include:</p> <ul style="list-style-type: none"> • WHS Acts and regulations • relevant standards • codes of practice from Australian and overseas engineering and technical associations and societies • environmental protection and planning law • risk assessments • registration requirements • safe work practices • state and territory regulatory requirements
Stakeholders	<p>Relevant stakeholders may include:</p> <ul style="list-style-type: none"> • teams • contractors • support professionals and teams • technicians • functional groups • customers • suppliers
Records of project	<p>Records of project may include:</p> <ul style="list-style-type: none"> • tenders and contracts • schedules • personnel • resource allocations and financial management procedures • standard operating procedures, including maintenance procedures • WHS committee minutes and action

	<ul style="list-style-type: none"> • risk management and mitigation • documentation and records of current safe work methods statements (SWMS), material safety data sheets (MSDS), work permits, standards and codes of practice • audits • meetings and communications • graphics and specifications
Continuous improvement implementation	<p>Continuous improvement implementation may relate to:</p> <ul style="list-style-type: none"> • plant, products, processes, systems or services, including design, development, implementation or manufacture, commissioning, operation or delivery and maintenance. It may include techniques, such as: <ul style="list-style-type: none"> • balanced scorecard • current and future state mapping • measuring performance against benchmarks • process improvement, problem solving and decision making • data management, generation, recording, analysing, storing and use of software • training for improvement systems participation • technical training
Appropriate technical and professional assistance	<p>Appropriate technical and professional assistance may include:</p> <ul style="list-style-type: none"> • technical support and advice relating to elements which have intrinsic dangers • professional and technical support for specific technologies and equipment • professional services for: <ul style="list-style-type: none"> • finance, accounts and tax • insurance and legal, • training and human resources
Constraints and contingencies	<p>Constraints and contingencies may be:</p> <ul style="list-style-type: none"> • financial, organisational, procedural or culture constraints • physical constraints, such as limits to resources, limits to site access or logistical limitations

Unit Sector(s)

Competency field

Unit sector Management and organisation

Custom Content Section

Not applicable.

MEM23004A Apply technical mathematics

Modification History

Release 1 - New unit. Replaces MEM23001A, but not equivalent.

Unit Descriptor

This unit of competency covers the application of mathematical analysis, graphical and software techniques to engineering problems. It includes exponential and logarithmic functions, trigonometric equations involving single and double angles, sequences and series, two dimensional vector analysis, complex numbers, determinants and matrices.

Application of the Unit

The unit applies to engineering or related activities requiring specific mathematical techniques. It is suitable for people giving technical support to design, operations or maintenance activities and those pursuing technical qualifications and careers at paraprofessional or technician level.

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 performance needed to demonstrate achievement of the element.

Elements and Performance Criteria

1	Determine scope of technical mathematical techniques required for an engineering application	1.1	Analyse an engineering application for required technical mathematical tasks
		1.2	Develop systematic methods for layout and solution checking
		1.3	Determine mathematical software required for analytical and graphical solutions and validate software using traditional solutions to simple examples
2	Apply technical mathematical techniques to engineering application	2.1	Use appropriate software for analytical and graphical solutions
		2.2	Convert between different number systems
		2.3	Use appropriate mathematical techniques required for analysis and solution
		2.4	Use appropriate data representations to communicate the solution to others.
		2.5	Report results and document calculations, graphs and analysis

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- solving mathematical problems using standard engineering software packages, and validating software results of simple examples analytically and/or graphically
- manipulating values using decimal, binary and hexadecimal number systems
- graphing and analysing functions for solutions:
 - exponential and logarithmic functions
 - trigonometric functions
- using the techniques of sequences and series to solve simple mathematical problems
- using the techniques of two dimensional vectors to solve mathematic and applied problems
- solving problems involving complex quantities using the properties, operations and theorems

of complex numbers

- using determinant and matrix analysis to solve algebraic and vectorial problems
- using probability to assess likely occurrences

Required knowledge

Required knowledge includes:

- software for mathematical analysis and graphical representations
- binomials and polynomials
- exponential and logarithmic functions
- trigonometric equations
- sequences and series
- two dimensional vectors
- complex numbers
- determinant and matrices
- probability
- stability analysis using plots

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 mathematical analysis, graphical and software techniques to engineering-related problems within the context of delegations and other checking and technical oversight procedures. The candidate may demonstrate competence through either working individually or as part of a team.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently: <ul style="list-style-type: none"> • solve mathematical problems using software • validate software results of simple examples analytically and/or graphically • manipulate values using decimal, binary and hexadecimal number systems • graph and analyse exponential, logarithmic and trigonometric functions for solutions • use the techniques of sequences and series to solve simple

	<p>mathematical problems</p> <ul style="list-style-type: none"> • use the techniques of two dimensional vectors to solve mathematic and applied problems • solve problems involving complex quantities using the properties, operations and theorems of complex numbers • use determinant and matrix analysis to solve algebraic and vectorial problems • use probability to assess likely occurrences.
Context of and specific resources for assessment	<ul style="list-style-type: none"> • 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 then a simulated working environment 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. • Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. • Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure correct interpretation and application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • 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. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

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.

<p>Engineering applications related to mathematical techniques in this unit</p>	<p>Most engineering disciplines will have applications supported by the technical mathematics skills described in this unit, including mechanical, manufacturing, maintenance and mechatronics engineering. Examples of engineering applications requiring mathematical skills described in this unit may include:</p> <ul style="list-style-type: none"> • vector analysis of force systems on beams and bodies • trigonometric plots related to waveforms for amplitude, frequency and phase shift analysis • matrix and determinant solutions of vector systems or simultaneous equations • complex plane analysis of control systems for stability analysis
<p>Scope of technical mathematical techniques</p>	<p>The scope of technical mathematical techniques required for an engineering application will vary and may include:</p> <ul style="list-style-type: none"> • standard mathematical software • decimal, binary and hexadecimal number systems • graph exponential and logarithmic functions required for the engineering application • solve trigonometric equations involving single and double angles • solve problems using simple binomials and polynomials • solve problems involving simple sequences and series in the engineering application • analyse two dimensional vectors • analyse complex numbers and represent graphically • analyse simple algebraic and vectorial problems using determinants and matrices • evaluate probability as a predictive tool in simple situations
<p>Number system</p>	<p>Number systems may include:</p> <ul style="list-style-type: none"> • decimal • binary • hexadecimal

Unit Sector(s)

Competency field

Unit sector Engineering science

Custom Content Section

Not applicable.

MEM23007A Apply calculus to engineering tasks

Modification History

Release 1 - New unit. Replaces MEM23002A, but not equivalent.

Unit Descriptor

This unit of competency covers the application of calculus, including differentiation and integration techniques to engineering applications. It includes the use and application of standard differentiation and integration rules, finding maximum and minimum values of curves, application to rates of change and slope, finding definite integrals, using method of substitution, using trigonometric identities and finding areas under curves.

Application of the Unit

The unit applies to engineering or related activities requiring the application of mathematical techniques using calculus. It is suitable for people giving technical support to design, operations or maintenance activities and those pursuing technical qualifications and careers at paraprofessional or technician level.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MEM23004A Apply technical mathematics

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.

Elements and Performance Criteria

1	Determine scope of calculus techniques required for an engineering application	1.1	Analyse an engineering application for required calculus tasks
		1.2	Develop systematic methods for layout and solution validation, including any required external sign-off of solution
		1.3	Identify calculus technique and any software required for analysis and resolution of identified engineering application tasks
		1.4	Identify sources for professional and technical assistance, if required
2	Apply differential techniques to engineering applications	2.1	Apply standard differentiation rules to solve engineering problems
		2.2	Check solution is laid out correctly and is error free
		2.3	Review solution to ensure it provides information relevant to resolution of engineering application task
		2.4	Report results and document calculations, graphs and analysis
3	Apply integration techniques to engineering applications	3.1	Apply standard integration rules to solve engineering problems
		3.2	Check solution is laid out correctly and is error free
		3.3	Review solution to ensure it provides information relevant to resolution of engineering application task
		3.4	Report results and document calculations, graphs and analysis

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- analysing engineering applications to determine relevant calculus techniques
- applying relevant differentiation and integration concepts and tools to engineering applications
- using appropriate software and/or scientific calculators to generate solutions to statistical and probability-related engineering problems
- using differentiation to find rates of change
- applying special calculus techniques to solve more complex integrals, such as:
 - method of substitution
 - using trigonometric identities
- identifying and solving simple first and second order differential equations
- identifying key points to find constants of integration
- finding integrals of algebraic, trigonometric and exponential functions
- establishing appropriate procedures for checking and validating solutions
- logical layout and presentation of data developed using calculus
- reporting and effectively communicating the results of calculus-based analysis

Required knowledge

Required knowledge includes:

- identifying appropriate limits and applying to engineering problems being solved with calculus techniques
- differentiation rules and techniques
- partial differentiation
- relationship between differentiation and attributes of mathematical curves and graphs
- optimisation of variables based on maximum and minimum values of mathematical curves and graphs
- integration as the reverse of differentiation
- integration rules and techniques
- the definite integral

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 calculus techniques to engineering and related problems within the context of specified engineering applications and solution validation and technical oversight procedures. The candidate may demonstrate competence through either working individually or as part of a team.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently: <ul style="list-style-type: none"> • solve mathematical problems related to engineering and manufacturing using calculus techniques • validate results of mathematical problems using calculus either analytically and/or graphically • manipulate engineering and manufacturing-related mathematical functions and equations using calculus techniques • analyse mathematical problems by using appropriate calculus techniques to achieve engineering and manufacturing solutions.
Context of and specific resources for assessment	<ul style="list-style-type: none"> • 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 then a simulated working environment 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. • Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. • Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure correct interpretation and application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • 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. • Assessment may be in conjunction with assessment of other units

	of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

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 applications related to calculus techniques in this unit	<p>Most engineering disciplines will have applications supported by the calculus skills described in this unit, including mechanical, manufacturing, maintenance and mechatronics engineering. Examples of engineering or manufacturing applications requiring calculus skills described in this unit may include:</p> <ul style="list-style-type: none"> • determining the point of maximum bending moment, slope and deflection for a beam • determining the depth of parabolic mirrors • determining moments of inertia of a range of engineering components • solving rectilinear motion problems
Scope of calculus techniques	<p>The scope of calculus techniques required for an engineering or manufacturing application will vary and may include:</p> <ul style="list-style-type: none"> • identification of appropriate limits • use of standard derivatives and rules • application of second and third derivatives • finding rates of change and slopes of curves • calculating maximum and minimum values of curves • solving first and second order differential equations • use of standard integrals and rules • finding constants of integration • finding areas under and between curves • integrating algebraic, trigonometric and exponential functions • the definite integral • identification of appropriate methods to solve more complex integration applications

Unit Sector(s)

Competency field

Unit sector Engineering science

Custom Content Section

Not applicable.

MEM234019A Apply finite element analysis in engineering design

Modification History

New unit

Unit Descriptor

This unit of competency covers the application of finite element analysis (FEA) for engineering design and modification analyses, including stress analysis, displacements and natural frequencies, and temperature and heat distributions in engineering or related applications.

Application of the Unit

This unit applies to engineering or related applications across all forms of manufacturing and engineering. It is suitable for people with structural, plant or equipment design or maintenance responsibilities, and those pursuing engineering or related qualifications and careers.

Prior experience in mechanics, mathematics and computing techniques and computer-aided design (CAD) is required and areas, such as thermodynamics or structures, depending on the application of the FEA.

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 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

- | | | |
|---|--|---|
| 1 | Integrate requirement for FEA into an engineering design application | 1.1 Establish functions, features and performance parameters of plant, structure or equipment to be analysed |
| | | 1.2 Determine parameters to the brief or contract |
| | | 1.3 Determine occupational health and safety (OHS), regulatory, sustainability and environmental requirements of the application |
| | | 1.4 Provide initial advice based on discipline knowledge, OHS and regulatory standards relating to the suitability of using FEA as an analytical technique |
| 2 | Apply FEA solution techniques | 2.1 Set up a finite element model, including internal and external parameters, element mesh and nodes |
| | | 2.2 Select appropriate solver and adjust parameters for optimum solution |
| | | 2.3 Generate and assess solution file for warnings or errors |
| | | 2.4 Interpret results and generate graphics |
| | | 2.5 Identify areas of excessive stress, deformation, instability and excessive temperatures |
| | | 2.6 Verify results to the required certainty level |
| | | 2.7 Apply systems or holistic thinking, contingencies and constraints management, problem solving and decision making techniques in making recommendations to achieve satisfactory functions, features and performance parameters |
| | | 2.8 Review initial results with client |
| | | 2.9 Negotiate adjustments to brief or contract parameters, if required |
| 3 | Embed FEA | 3.1 Report and recommend design improvements or |

results in design application		modifications as a result of the FEA analysis
	3.2	Document results of investigations, analysis and recommendations
	3.3	Obtain sign-off

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- gathering information relevant to the FEA task
- interpreting and evaluating documentation, specifications and drawings for FEA purposes
- researching FEA, mathematical techniques, applicability and limitations, software and evolving opportunities for FEA
- setting up FEA model, parameters, element mesh and nodes
- using FEA software, including pre- and post-processor, if any, effectively
- constructing models of engineering part or structure suitable for FEA using appropriate software
- determining and setting parameters and conditions for required type of analysis
- applying boundary conditions to suit type of analysis required, including axisymmetric analysis
- choosing, setting up, and running appropriate solvers, such as linear static, linear buckling, non-linear static, natural frequency, steady state, heat, and so on
- interpreting results, generating graphics and identifying significant issues
- validating software outputs
- reporting and documenting results

Required knowledge

Required knowledge includes:

- FEA task parameters for applications, such as:
 - stresses and displacements
 - natural frequencies
 - heat and temperature distribution
- software modelling and validation techniques, including:
 - element type and shape for error minimisation
 - library files

- geometry importation from other software packages
- application of boundary conditions
- validation using comparison with traditional solution of simple examples and reviewing of past successful applications
- methods for presentation of results, including software-generated graphics
- measures of excessive stress and/or deformation and to recommend modifications
- software functions and features, such as:
 - deformed displays
 - colour contour plots, contour averaging and contour jumps
 - peeking, graphing and animating
 - multiple views
- coordinate systems:
 - Cartesian
 - polar
 - spherical coordinate systems
- stress concentrations
- structural loads:
 - dead loads, live loads and wind loads
 - structural and non-structural mass
- material libraries:
 - types of beam, plate and brick elements
 - properties of materials, such as stress, strain, modulus of elasticity, modulus of rigidity, Poisson's ratio and allowable stress
- stresses:
 - equivalent stresses based on Von Mises criterion and Tresca criterion
 - shear force and bending moment diagrams, bending stress and torsional stress
 - heat transfer modes (conduction, convection and radiation)
 - thermal stress
- accuracy checking methods, including use of strain gauges and solvers
- software validation techniques

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.

Critical aspects for assessment and evidence	Assessors must be satisfied that the candidate can competently and consistently:
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required to demonstrate competency in this unit	<ul style="list-style-type: none"> • determine functions, features and performance parameters of plant, structure or equipment to be analysed • determine parameters to the brief or contract, OHS, regulatory, risk management and sustainability requirements • communicate, advise, negotiate and review with stakeholders and client throughout process • apply FEA solution techniques • set up FEA model, parameters, element mesh and nodes • select solver and adjust and optimise parameters • generate and assess solution file • interpret results, generate graphics and identify significant issues • validate software outputs • apply systems or holistic thinking, contingencies and constraints management, problem solving and decision making techniques in making recommendations • report and document results.
Context of and specific resources for assessment	<ul style="list-style-type: none"> • 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 a simulated working environment 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. • Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. • Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.

Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.
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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.

FEA	FEA uses numerical techniques to find approximate solutions for engineering problems, such as: <ul style="list-style-type: none"> • load, stiffness and deflection analysis and animations for vehicle crash simulations • hopper and bin designs • piping systems • heat flow, such as in in cavity moulds, load distribution, stiffness and strength in structures
Parameters to the brief	The design brief may include the design of new equipment or fault analysis, rectification or modification to an existing design. Parameters to the design brief may include: <ul style="list-style-type: none"> • determination of the degree of innovation and creativity expected by the client • design process limits and budgets • product cost limits and budgets • performance specifications • equipment availability, capacities and restrictions • specified administrative, communication and approval procedures • other special features and limits in the design brief
Standards and codes	Standards and codes refer to all relevant Australian and international standards and codes applicable to a particular design task
OHS, regulatory, sustainability and environmental requirements	OHS, regulatory, sustainability and environmental requirements may include: <ul style="list-style-type: none"> • OHS Acts and regulations • relevant standards • industry codes of practice • risk assessments

	<ul style="list-style-type: none"> • registration requirements • safe work practices • minimising ecological and environmental footprint of process, plant and product • maximising economic benefit of process plant and product to the organisation and the community • minimising the negative OHS impact on employees, community and customer • state and territory regulatory requirements
Appropriate solver	<p>Appropriate solver may include:</p> <ul style="list-style-type: none"> • sparse • preconditioned conjugate gradient (PCG) • incomplete cholesky conjugate gradient • frontal
Client	<p>Client may be:</p> <ul style="list-style-type: none"> • internal or external to the organisation

Unit Sector(s)

Engineering practice

Custom Content Section

Not applicable.

MEM234022A Apply advanced calculus to technology problems

Modification History

New unit

Unit Descriptor

This unit of competency covers the application of advanced calculus in an engineering or related application. It includes differential and integral calculus and covers both the application of theory in simple calculations and the use of relevant software packages for more complex situations.

Application of the Unit

This unit applies to projects or tasks requiring advanced calculus, either manually or through use of an appropriate software package. It is suitable for paraprofessionals and technologists required to solve advanced mathematical problems in an engineering or related field, or those pursuing technologist careers and qualifications.

Prior or concurrent experience in mathematics covering calculus and differentials is required.

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 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

- | | | | |
|---|---|-----|--|
| 1 | Identify a need for the application of calculus | 1.1 | Identify a problem requiring application of calculus |
| | | 1.2 | Define the problem |
| | | 1.3 | Determine data currently available for analysis |
| | | 1.4 | Identify ways of obtaining other required data |
| | | 1.5 | Determine information required from outcome |
| 2 | Prepare to solve problem by calculus | 2.1 | Determine appropriate calculus to be applied |
| | | 2.2 | Identify and gain access to appropriate computational devices |
| | | 2.3 | Collect required input data |
| | | 2.4 | Analyse collected data for suitability and completeness |
| | | 2.5 | Take appropriate action to address any deficiencies found |
| 3 | Solve problem using calculus | 3.1 | Apply appropriate technique to collected data |
| | | 3.2 | Check answer by appropriate means |
| | | 3.3 | Interpret answer to determine information required by problem definition |
| 4 | Communicate outcomes | 4.1 | Communicate outcome to relevant stakeholders by appropriate means |
| | | 4.2 | Explain outcome to stakeholders, as appropriate |
| | | 4.3 | Check outcome has addressed problem |

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- identifying and defining problems
- collecting and analysing data
- reporting and presenting data and quantitative information
- communicating effectively with stakeholders on problem resolution

Required knowledge

Required knowledge includes:

- differential calculus:
 - introduction - review of standard derivatives and rules:
 - power rule
 - product rule
 - quotient rule
 - chain or function of a function rule
 - standard derivatives for a variety of common functions
 - higher order derivatives
 - graph sketching
 - maxima and minima (optimisation)
 - rates of change
 - small increments (errors and approximations)
 - implicit differentiation
 - logarithmic differentiation
 - partial differentiation
 - directional derivatives
- integral calculus
 - revision-integration techniques (areas and volumes)
 - partial fractions
 - integration by parts
 - trigonometric and hyperbolic substitution methods
 - improper integrals
 - integration of partial derivatives
 - evaluation of arc lengths
 - evaluation of surface areas

- mean and RMS values
- approximate integration (the trapezoidal and Simpson's rules)
- evaluation of centre of mass
- evaluation of centroidal positions in plane regions
- evaluation of moments of inertia and second moments of area
- evaluation of work and energy
- evaluation of centres of pressure on submerged plates

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.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently: <ul style="list-style-type: none"> • identify appropriate calculus technique for engineering or related problems • apply the appropriate technique to the problem • check answer has addressed problem • communicate the outcome of the analysis in an appropriate way.
Context of and specific resources for assessment	<ul style="list-style-type: none"> • 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 a simulated working environment must be used where the range of conditions reflects realistic workplace situations. The competency covered by this unit would be demonstrated by an individual working alone or as part of a team. • Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. • Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	<ul style="list-style-type: none"> • Assessment must satisfy the endorsed Assessment Guidelines of the MEM05 Metal and Engineering Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its

	<p>correct interpretation and application.</p> <ul style="list-style-type: none"> • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

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. 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.

Data available	<p>Data currently available includes:</p> <ul style="list-style-type: none"> • all relevant data which is currently available within the organisation or could be readily obtained
Information required	Information required means the outcome which needs to be produced in order to solve/assist in resolving the defined problem
Calculus	<p>Calculus for this unit refers to:</p> <ul style="list-style-type: none"> • problem solving using one or more or any of the techniques listed under 'required knowledge' or a related technique
Computational device	<p>Computational devices include:</p> <ul style="list-style-type: none"> • calculators with calculus functions • computer software packages
Appropriate action	<p>Appropriate action may include:</p> <ul style="list-style-type: none"> • taking necessary steps to obtain required data • obtaining some relevant proxy for the desired data • choosing a different calculus/computational device which will function with available data
Appropriate technique	<p>Appropriate technique includes:</p> <ul style="list-style-type: none"> • selected calculus which will yield required outcome

	<ul style="list-style-type: none"> • technique which is appropriate for the available data and which is relevant to the problem
Check answer	Checking answer means that the answer is examined to ensure it is within the range of expected logical results
Interpret answer	Interpret answer means translating the result of the calculus solution into a form which is useable by the relevant stakeholders
Appropriate communication	<p>Appropriate communication may include:</p> <ul style="list-style-type: none"> • report • presentation • verbal communication • web-based • electronic or hard copy
Check outcome	<p>Check outcome includes:</p> <ul style="list-style-type: none"> • ensuring that the result of the analysis does assist in the resolution of the problem

Unit Sector(s)

Not applicable.

Custom Content Section

Not applicable.

MEM24001B Perform basic penetrant testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing basic penetrant testing procedures in a range of industrial applications.
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Application of the Unit

Application of the unit	<p>This unit applies to basic penetrant testing techniques on fabrications, structures and components across a wide range of industries and restricted to basic visible dye and/or process penetrant line methods.</p> <p>The work can relate to scheduled and unscheduled maintenance activities, using general tools, specific penetrant testing equipment as specified in maintenance documentation, testing procedures or operator instructions.</p> <p>Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures.</p> <p>Penetrant testing is performed on critical component or structural zones.</p> <p>All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - must be subject to safe work habits and must be stored and used in accordance with safe work practices.</p> <p>This unit should not be selected when Unit MEM24002B</p>
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	<p>(Perform penetrant testing) has already been selected.</p> <p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>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.</p>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for basic penetrant testing	1.1. Inspection areas are cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform basic penetrant testing	2.1. Nominated test is identified from standard operating procedures. 2.2. Test equipment is prepared in accordance with standard operating procedures. 2.3. Test media is selected and applied in accordance with workplace practices and specifications. 2.4. Penetrant test is carried out in accordance with relevant work instructions and OH&S requirements. 2.5. Penetrant testing equipment is maintained and stored in accordance with standard operating procedures and OH&S requirements.
3. Report the results of penetrant test(s)	3.1. Basic indications are checked and defects are identified in accordance with enterprise standards and/or procedures. 3.2. Basic indications are confirmed in accordance with enterprise standards and/or procedures. 3.3. Test results are reported in accordance with enterprise standards and/or 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:

- preparing inspection areas
- identifying discontinuities
- applying procedures

REQUIRED SKILLS AND KNOWLEDGE

- applying test media
- applying principles of penetrant testing techniques
- identifying defects
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures.
- following oral instructions
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes
- precleaning methods and their areas of use - solvents, vapour degrease, etching, detergents, paint removers, mechanical methods
- consequences of incorrect preparation
- procedures and OH&S requirements in relation to the preparation process
- basic concepts and principles of NDT; general terms, purpose of NDT and areas of application of NDT
- scope and basic description of test
- general properties of penetrants - penetrability, removability, visibility
- emulsifier types
- developer types
- use of standard test panels
- established inspection procedures and techniques
- types of discontinuities and their consequences
- procedure for carrying out penetrant testing
- penetrant application
- dwell times
- penetrant removal
- developer application
- dry powder
- development time
- factors affecting indications
- non-relevant indications
- post-cleaning methods and their areas of use
- basic maintenance and storage procedures for testing equipment
- OH&S requirements including storage requirements
- definition of a defect and common basic defects
- methods/procedures for reporting test results

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to perform basic penetrant testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing basic penetrant testing or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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,</p>

EVIDENCE GUIDE	
	product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Preparation processes	Surface cleaning and drying
Obvious discontinuities	Observed changes in material homogeneity
Reported	Accurate identification of location and size of discontinuities

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing
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MEM24002B Perform penetrant testing

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers performing penetrant testing in a range of industrial applications.
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Application of the Unit

Application of the unit	<p>This unit applies to penetrant testing techniques on fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent by portable penetrant testing, processing on a dedicated penetrant line, visible dye and fluorescent methods.</p> <p>The work can relate to scheduled and unscheduled maintenance activities using general tools and specific penetrant testing equipment as specified in maintenance documentation, testing procedures or operator instructions.</p> <p>Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Penetrant tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712. Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices.</p>
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	<p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p> <p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

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
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	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 inspection areas for penetrant testing	<p>1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials.</p> <p>1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements.</p> <p>1.3. Inspection areas are visually assessed and obvious discontinuities are identified.</p>
2. Perform penetrant testing	<p>2.1. The most appropriate penetrant test for the material/application is selected.</p> <p>2.2. Test equipment is selected and prepared in accordance with standards and/or procedures.</p> <p>2.3. Appropriate test media is selected and applied in accordance with workplace/industry practices.</p> <p>2.4. Penetrant test is carried out in accordance with relevant standards, specifications and OH&S requirements.</p> <p>2.5. Penetrant test equipment is checked for defects, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.</p>
3. Interpret and report the results of penetrant test(s)	<p>3.1. Indications are assessed and defects are detected and classified in accordance with national and international codes and standards.</p> <p>3.2. Defects are confirmed in accordance with enterprise procedures and industry practices.</p> <p>3.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.</p>

Required Skills and Knowledge

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:

- interpreting and following procedures
- identifying inspection areas
- conducting visual inspections
- identifying discontinuities and defects
- selecting appropriate testing techniques and procedures
- using decision making skills
- assessing risk
- performing measurements needed to meet the requirements of this unit
- entering routine and familiar information onto proformas and standard workplace forms
- locating, reading and interpreting information on written job instructions, specifications, drawings, charts, lists and other reference documentation
- planning, sequencing operations

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a range of test surfaces
- procedure, statutory and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences/effect on the material
- penetrant testing techniques and procedures for a range of situations
- tools, equipment, techniques
- principles and applications of penetrant testing techniques
- hazards and safety requirements associated with penetrant testing
- maintenance and storage procedures for test equipment
- common faults and damage
- range of defects
- meaning and application of national and international codes and standards
- methods/procedures for reporting test results
- implications of test results for the particular material/application
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- use and application of personal protective equipment
- safe work practices and procedures
- relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	<p>A person who demonstrates competency in this unit must be able to perform penetrant testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p>
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing penetrant testing in a range of industrial applications or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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</p>

EVIDENCE GUIDE	
	relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Preparation processes	Surface cleaning and drying
Obvious discontinuities	Observed changes in material homogeneity
Reported	Accurate identification of location and size of discontinuities

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Co-requisite units		

Competency field

Competency field	Non-destructive testing
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MEM24003B Perform basic magnetic particle testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing basic magnetic particle testing procedures in a range of industrial applications. It covers the principles of magnetism and the associated application of basic magnetic particle testing techniques in the field of non-destructive testing. Knowledge of metallurgy associated with the level of application in this unit is required.
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Application of the Unit

Application of the unit	<p>This unit applies to portable and fixed ('yoke' or 'bench') basic magnetic particle testing techniques on fabrications, structures and components across a wide range of industries.</p> <p>The work can relate to scheduled and unscheduled maintenance activities using general tools and specific magnetic testing equipment as specified in maintenance documentation, testing procedures or operator instructions.</p> <p>Actual and potential defects are considered, together with ongoing abnormalities in fabrications, components and structures. Magnetic particle testing is performed on critical component or structural zones. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - must be subject to safe work habits and must be stored and used in accordance with safe work practices.</p>
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	<p>This unit should not be selected when Unit MEM24004B (Perform magnetic particle testing) has already been selected.</p> <p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p> <p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	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
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	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 inspection areas for basic magnetic particle testing	<p>1.1. Inspection areas are cleaned and prepared for testing using appropriate procedures and materials.</p> <p>1.2. Preparation processes are carried out in accordance with the relevant specifications and OH&S requirements.</p> <p>1.3. Inspection areas are visually assessed and obvious discontinuities are identified.</p>
2. Perform basic magnetic particle testing	<p>2.1. Nominated 'yoke' or 'bench' magnetic particle testing procedure is identified from standard operating procedures.</p> <p>2.2. Test equipment is prepared in accordance with relevant standards and/or procedures.</p> <p>2.3. Magnetic particle test is carried out in accordance with relevant work instructions and OHS requirements.</p> <p>2.4. Magnetic particle testing equipment is maintained and stored in accordance with standard operating procedures and OH&S requirements.</p>
3. Report the results of magnetic particle test(s)	<p>3.1. Basic indications are checked and defects are identified in accordance with enterprise standards and/or procedures.</p> <p>3.2. Basic indications are confirmed in accordance with enterprise standards and/or procedures.</p> <p>3.3. Test results are reported in accordance with enterprise standards and/or procedures.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

REQUIRED SKILLS AND KNOWLEDGE**Required skills**

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques and procedures
- assessing risks
- entering routine and familiar information onto proformas and standard workplace forms
- locating, reading and interpreting information on written job instructions, specifications, charts, lists and other reference documentation
- planning, sequencing operations

Required knowledge

Look for evidence that confirms knowledge of:

- surface preparation
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences
- scope and basic principles of magnetic particle testing
- procedure for carrying out magnetic particle test using either the 'yoke' or 'bench'
- advantages and limitations of magnetic particle testing
- hazards and safety precautions associated with magnetic particle testing
- basic maintenance and storage procedures for testing equipment
- common basic defects
- methods/procedures for reporting test results
- advantages, limitations of various equipment
- magnetic particle application - methods for wet, dry particles
- recording and reporting results of simple tests
- safety precautions in testing
- use of toxic, flammable materials, electrical hazards
- use and application of personal protective equipment
- safe work practices and procedures
- relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to perform basic magnetic particle testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing basic magnetic particle testing procedures in a range of industrial applications or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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.</p>

EVIDENCE GUIDE

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.

Preparation processes	Surface cleaning and drying
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Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Non-destructive testing
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MEM24004B Perform magnetic particle testing

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers performing magnetic particle testing in a range of industrial applications.
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Application of the Unit

Application of the unit	<p>This unit applies to magnetic particle testing techniques on fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent.</p> <p>The work can relate to scheduled and unscheduled maintenance activities using general tools specific testing equipment as specified in maintenance documentation, testing procedures or operators instructions.</p> <p>Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Magnetic particle testing is performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal and OH&S regulations. Certification against Australian Standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices.</p> <p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p>
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	<p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 4</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>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.</p>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for magnetic particle testing	1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform magnetic particle testing	2.1. The most appropriate magnetic particle test for the material/application is selected. 2.2. Testing equipment is selected and prepared in accordance with standards and/or procedures. 2.3. Magnetic particle test is carried out in accordance with relevant standards, specifications and OH&S requirements. 2.4. Magnetic particle testing equipment is checked for defects, and maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.
3. Interpret and report the results of magnetic particle tests	3.1. Indications are assessed and defects are detected and classified in accordance with national and international codes and standards. 3.2. Defects are confirmed in accordance with enterprise procedures and industry practices. 3.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- reading, interpreting and applying relative testing standards
- reading, interpreting and applying relative conformance standards
- assessing risk
- undertaking calculations using formulae
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences
- magnetic particle testing techniques and procedures for a range of situations
- system verification checks necessary to carry out the magnetic particle test
- principles and applications of magnetic particle testing
- advantages and limitations of magnetic particle testing
- hazards and safety precautions associated with magnetic particle testing
- basic maintenance and storage procedures for testing equipment
- types of magnetism;
- magnetic properties
- magnetic materials
- magnetic circuits
- relative permeability of common engineering materials
- magnetic discontinuity, leakage fields
- types of equipment - portable, stationary, automated etc.
- equipment features
- nature and properties of the various types of magnetising current
- current requirements for testing
- media types - advantages and limitations of dry powders and fluid suspensions
- quality control of media, viewing conditions
- disposal procedures
- environment care
- preparation of parts

REQUIRED SKILLS AND KNOWLEDGE

- effect of surface coatings on sensitivity
- effect of surface roughness
- dressing of welds
- interpretation of indications
- lighting conditions
- use of magnification
- factors influencing appearance
- spurious indications, false indications
- surface and sub-surface indications
- common basic defects
- methods/procedures for reporting test results
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- use and application of personal protective equipment
- safe work practices and procedures
- 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 be able to perform magnetic particle testing. 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

EVIDENCE GUIDE	
	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing magnetic particle testing in a range of industrial applications or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Preparation processes	Surface cleaning and drying

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing
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MEM24005B Perform basic eddy current testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers operating eddy current testing equipment and performing basic testing procedures in a specific range of industrial applications. Knowledge of metallurgy, electricity, magnetism and electromagnetism associated with the level of application in this unit is required.
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Application of the Unit

Application of the unit	<p>This unit applies to the preparation and performance of eddy current testing on fabrications, structures and components across a wide range of industries. It includes wheel bead seat, production line, tube production line and conductivity measurement methods. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific eddy current testing equipment as specified in maintenance documentation, testing procedures or operator instructions.</p> <p>Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures. Eddy current testing is performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices.</p>
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	<p>This unit should not be selected when Unit MEM24006B (Perform eddy current testing) has already been selected.</p> <p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	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
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	with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for basic eddy current testing	<p>1.1. Inspection areas are cleaned and prepared for testing using appropriate procedures and materials.</p> <p>1.2. Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements.</p> <p>1.3. Inspection areas are visually assessed and obvious discontinuities are identified.</p>
2. Perform basic eddy current testing	<p>2.1. Nominated test is identified from standard operating procedures.</p> <p>2.2. Test equipment is prepared in accordance with standards and/or procedures.</p> <p>2.3. Eddy current test procedure is carried out in accordance with relevant work instructions and OH&S requirements.</p> <p>2.4. Eddy current test equipment is maintained and stored in accordance with standard operating procedures and OH&S requirements.</p>
3. Report the results of basic eddy current test(s)	<p>3.1. Basic indications are checked and defects are identified in accordance with enterprise standards and/or procedures.</p> <p>3.2. Basic indications are confirmed in accordance with enterprise standards and/or procedures.</p> <p>3.3. Test results are reported in accordance with enterprise standards and/or procedures.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- documenting and reporting
- assessing risk
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings
- performing calculations using formulae

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes
- procedures and OH&S requirements in relation to the preparation process
- visual inspection
- eddy current instrument set-up
- probe selection
- established assessment procedures and techniques
- types of discontinuities and their consequences
- procedure for carrying out basic eddy current testing
- system verification checks necessary to carry out basic eddy current testing
- testing and compliance standards (enterprise specific)
- standard recording and reporting formats
- standard defects and comparative techniques
- basic principles of electricity, magnetism, electromagnetism and eddy current testing
- basic electrical principles
- test principles
- overview of factors affecting eddy current response
- basic metallurgy
- limitations of eddy current testing
- hazards and safety precautions associated with eddy current testing
- basic maintenance and storage procedures for testing equipment
- common basic defects (these are industry-specific and relevant workplace defects should be chosen)
- methods/procedures for reporting test results
- use and application of personal protective equipment

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to perform basic eddy current testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating eddy current testing equipment and applying basic testing procedures in a specific range of industrial applications, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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</p>

EVIDENCE GUIDE	
	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	
<p>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.</p>	
Preparation processes	Surface cleaning and drying

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing
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MEM24006B Perform eddy current testing

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers performing eddy current testing in a range of industrial applications.
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Application of the Unit

Application of the unit	<p>This unit applies to inspection, interpretation, classification and reporting of results of eddy current testing on fabrications, structures and components across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific testing eddy current testing tools and equipment as specified in maintenance documentation, testing procedures or operator instructions.</p> <p>Actual and potential defects are considered, together with ongoing abnormalities in fabrications, components, structures and/or aircraft components. Eddy current tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices.</p> <p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p>
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	<p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 6</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>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.</p>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for eddy current testing	1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials. 1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Perform eddy current testing	2.1. The most appropriate eddy current test for the material/application is selected. 2.2. Test equipment is selected and prepared in accordance with standards and/or procedures. 2.3. Eddy current test is carried out in accordance with relevant standards, specifications and OH&S requirements. 2.4. Eddy current test equipment is checked for defects, and maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.
3. Interpret and report the results of eddy current tests	3.1. Indications are assessed and defects are detected and classified in accordance with national and international codes and standards. 3.2. Defects are confirmed in accordance with enterprise procedures and industry practices. 3.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques and procedures
- reading, interpreting and applying relative testing standards
- reading, interpreting and applying relative conformance standards
- using calculations relating to eddy current testing
- assessing risk
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- types of discontinuities and their consequences
- procedure for carrying out eddy current testing
- tools, equipment, techniques and system verification checks necessary to carry out eddy current testing
- basic principles of electricity, magnetism, electromagnetism and eddy current testing:
 - Reactance - field made by eddy current
 - Biot and Savant law - Definition, Practical (right hand) rules
 - Amperes law - Definition, Applications (toroid, infinite coil, flat coil)
 - Lenz law - Definition, Auto-induction factor, Mutual induction factor, Coupling factor
- induced currents - short circuit coil, metallic mass, skin effect, reactance
- cylindrical bars
- theory of eddy currents
- tubes
- geometric defect characterisation
- multiple defects
- characteristics of eddy current probes
- eddy current equipment:
 - transmission
 - reception
 - data presentation

REQUIRED SKILLS AND KNOWLEDGE

- equipment controls
- types of equipment:
- physical properties of materials
- electrical conductivity
- magnetic permeability
- applications of eddy current testing
- influence of various parameters on eddy current measurement
- defect position and orientation
- compensation
- structure and geometry of test part
- coupling influence
- relative speed
- limitations of eddy current testing
- hazards and safety precautions associated with eddy current testing
- basic maintenance and storage procedures for testing equipment
- common basic defects
- methods/procedures for reporting test results
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- 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 eddy current testing. 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

EVIDENCE GUIDE	
	in new and different situations and contexts.
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing eddy current testing in a range of industrial applications, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
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

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Preparation processes	Surface cleaning and drying
Obvious discontinuities	Observed changes in material homogeneity
Defects	Corrosion, metal fatigue, deformation in non-ferrous/ferrous alloys steels, fatigue cracks, stress corrosion cracking, heat damage, metal properties sorting, manufacturing defects, coating thickness measurement etc.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing
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MEM24007B Perform ultrasonic thickness testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing ultrasonic thickness testing in a range of industrial applications. Knowledge of metallurgy associated with the level of application in this unit is required.
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Application of the Unit

Application of the unit	<p>This unit applies to inspecting, interpreting and reporting on ultrasonic testing techniques of fabrications, structures and components. Testing is across a wide range of industries and includes identifying abnormalities such as thickness measurement of corrosion, laminations of non-ferrous/ferrous alloys steels, composite materials. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific ultrasonic testing equipment as specified in maintenance documentation, testing procedures or operators instructions.</p> <p>Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures on a wide range of applications. Ultrasonic tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products -</p>
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	<p>are subject to safe work habits and must be stored and used in accordance with safe work practices.</p> <p>This unit should not be selected when Unit MEM24008B (Perform ultrasonic testing) has already been selected.</p> <p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p> <p>Band: A</p> <p>Unit Weight: 2</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	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	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the
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unit of competency.	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 inspection areas for ultrasonic thickness testing	<p>1.1. Inspection areas are cleaned and prepared for testing using appropriate procedures and materials.</p> <p>1.2. Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements.</p> <p>1.3. Inspection areas are visually assessed for obvious discontinuities.</p>
2. Perform ultrasonic thickness testing	<p>2.1. Nominated ultrasonic thickness test is identified from standard operating procedures.</p> <p>2.2. Test equipment is prepared in accordance with standard operating procedures.</p> <p>2.3. Ultrasonic tests are carried out in accordance with relevant standards and OH&S requirements.</p> <p>2.4. Ultrasonic test equipment is maintained and stored in accordance with standard operating procedures and OH&S requirements.</p>
3. Report the results of ultrasonic thickness tests	<p>3.1. Basic thicknesses are identified and explained in accordance with enterprise standards and/or procedures.</p> <p>3.2. Basic thicknesses are confirmed in accordance with enterprise standards and/or procedures.</p> <p>3.3. Test results are reported in accordance with enterprise standards and/or procedures.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- performing calculations
- assessing risk
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a variety of test surfaces
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- basic principles of ultrasonic thickness testing
- properties and behaviour of ultrasound
- basic concepts associated with frequency, velocity, wavelength, amplitude
- generation of ultrasound
- types of discontinuities and their consequences
- procedures for carrying out ultrasonic thickness tests
- tools, equipment, techniques and system verification checks necessary to carry out the ultrasonic thickness test
- advantages and limitations of ultrasonic thickness testing
- hazards and safety requirements associated with ultrasonic thickness testing
- basic maintenance and storage procedures for testing equipment
- common basic defects
- indications and thicknesses
- methods/procedures for reporting test results
- ultrasonic thickness testing equipment
- types of displays:
 - a-scan display
 - b-scan display
- types of couplants, desirable characteristics
- straight beam testing method:
- calibration of thickness testing equipment
- frequency
- probe size and shape
- thickness testing

REQUIRED SKILLS AND KNOWLEDGE

- plate testing
 - acceptance standards within the scope of this unit
- recording and reporting:
 - job records
 - routine reports
 - codes and standards
- variables affecting test results
- methods of controlling variables
- component variables:
 - size and geometry
 - distance location from entry surface
 - orientation to entry surface
 - reflecting characteristics of back wall
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- 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 ultrasonic thickness testing. 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

EVIDENCE GUIDE	
	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing ultrasonic thickness testing in a range of industrial applications, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Preparation processes	Surface cleaning and drying

RANGE STATEMENT	
Obvious discontinuities	Observed changes in material homogeneity
Reported	Accurate identification of location and size of discontinuities

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing
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MEM24008B Perform ultrasonic testing

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers operating ultrasonic testing equipment and applying the testing procedure in a range of industrial applications.
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Application of the Unit

Application of the unit	<p>This unit applies to inspecting, interpreting, classifying and reporting on ultrasonic testing techniques of fabrications, structures and components. Testing is across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent and includes identifying abnormalities. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific ultrasonic testing equipment as specified in maintenance documentation, testing procedures or operator instructions.</p> <p>Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures on a wide range of applications. Ultrasonic tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices.</p>
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	<p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p> <p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 6</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

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
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	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 inspection areas for ultrasonic testing	<p>1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials.</p> <p>1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements.</p> <p>1.3. Inspection areas are visually assessed and obvious discontinuities are identified.</p>
2. Perform ultrasonic testing	<p>2.1. The most appropriate ultrasonic test for the material/application is selected.</p> <p>2.2. Testing equipment is selected and prepared in accordance with standards and/or procedures.</p> <p>2.3. Ultrasonic test is carried out in accordance with relevant standards, specifications and OH&S requirements.</p> <p>2.4. Ultrasonic testing equipment is checked for defects, and maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.</p>
3. Interpret and report the results of ultrasonic tests	<p>3.1. Indications are assessed and defects are detected and classified in accordance with national and international codes and standards.</p> <p>3.2. Defects are confirmed in accordance with enterprise procedures and industry practices.</p> <p>3.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service requirements.</p>

Required Skills and Knowledge

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:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- analysing test results
- reading, interpreting and applying relative testing standards
- reading, interpreting and applying relative conformance standards
- performing calculations relating to ultrasonic testing
- assessing risk
- entering routine and familiar information onto proformas and standard workplace forms

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a variety of test surfaces
- procedures and OH&S requirements in relation to the preparation process
- established assessment procedures and techniques
- principles of ultrasonic testing
- variables affecting test selection
- variables affecting test results
- ultrasound - frequency, velocity, wavelength, amplitude
- behaviour of ultrasound at interfaces
- characteristics of ultrasound in materials
- generation of ultrasound
- detection of ultrasound
- the flaw detector
- basic test methods:
 - pulse-echo and transmission methods
 - resonance methods
 - a, b, c, and p scan
 - types of coupling
 - single, dual and two-probe methods
- characteristics and applications associated with probes
- calibration methods
- variables

REQUIRED SKILLS AND KNOWLEDGE

- contact and immersion test methods
- testing methods and their application
- flaw size evaluation
- interpretation and evaluation:
 - defect types as related to product
 - codes and standards
- recording and reporting:
 - job records
 - routine reports
 - codes and standards
- written procedures:
 - presentation
 - use of standards
- types of discontinuities and their consequences
- procedures for carrying out ultrasonic tests
- tools, equipment, techniques and system verification checks necessary to carry out the ultrasonic test
- advantages and limitations of ultrasonic testing
- hazards and safety requirements associated with ultrasonic thickness testing
- maintenance and storage procedures for testing equipment
- range of defects
- methods/procedures for reporting test results
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- 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 ultrasonic testing. Competency in this unit cannot be claimed until all prerequisites have been

EVIDENCE GUIDE	
	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	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating ultrasonic testing equipment and the application of the testing procedure in a range of industrial applications, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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	
<p>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.</p>	
Preparation processes	Surface cleaning and drying
Obvious discontinuities	Observed changes in material homogeneity
Defects	Corrosion, metal fatigue, deformation in non-ferrous/ferrous alloys steels, composite materials, fatigue cracks, stress corrosion cracking, manufacturing defects, thickness measurement and fit, mechanical and bonded repairs, laminar tearing, welding defects and casting defects and/or aircraft components
Reported	Accurate identification of location and size of discontinuities

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing
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MEM24009B Perform basic radiographic testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing basic radiographic testing procedures in a range of industrial applications. Knowledge of metallurgy associated with the level of application in this unit is required.
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Application of the Unit

Application of the unit	<p>This unit applies to working with ionizing radiation in open or closed sites; on fabrications, structures and components across a wide range of industries. The work can relate to scheduled and unscheduled maintenance activities using general tools and specific radiographic testing equipment as specified in maintenance documentation, testing procedures or operators instructions. All testing must be completed with particular attention to personal and OH&S regulations. Ionizing radiation equipment materials and chemicals, which are subject to codes and regulations, must be stored, used, and transported in accordance with safe work practices. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>This unit should not be selected when Unit MEM24010B (Perform radiographic testing) has already been selected.</p> <p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p> <p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Band: A</p>
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	Unit Weight: 2
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM13013B	Work safely with ionizing radiation
	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas ready for basic radiographic testing	1.1. Radiographic specimens are cleaned and prepared for testing using appropriate procedures and materials.

ELEMENT	PERFORMANCE CRITERIA
	1.2. Preparation processes are carried out in accordance with the relevant procedures and OH&S requirements. 1.3. Inspection areas are visually assessed and obvious discontinuities are identified.
2. Set up radiographic test equipment	2.1. Nominated test is identified from standard operating procedures. 2.2. Radiation testing and processing equipment is set up in accordance with standard operating procedures.
3. Carry out basic radiographic tests	3.1. Basic properties of X-rays and gamma rays are identified. 3.2. Safety practices and controls for minimising radiation exposure are applied. 3.3. Radiographic testing and safety equipment is operated in accordance with relevant work instructions and OH&S requirements. 3.4. Films are processed to achieve optimum results.

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:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- calculating and producing optimum quality radiographs
- effectively designing exposure and storage areas
- calculating shielding thicknesses
- reading, interpreting and applying relative testing standards
- reading, interpreting and applying relative conformance standards
- documenting and reporting
- assessing risk

REQUIRED SKILLS AND KNOWLEDGE**Required knowledge**

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a range of test surfaces
- cleaning and preparation processes for a range of test surfaces
- assessment procedures and techniques
- types of discontinuities and their consequences/effect on the material
- procedure for carrying out each radiographic test
- principal types of X-ray generators and radioisotopes and their effect on radiographic sensitivity
- tools, equipment, techniques and system verification checks
- relevant standards, regulations and codes
- hazards associated with radiographic testing
- procedures for specialised radiographic applications
- principles of image formation, film and chemical properties and processing techniques
- various types of films and screens, their properties and effects on image quality
- maintenance and storage procedures for test equipment
- common faults and damage
- safety features of radioisotope cameras and X-ray equipment
- production of X-rays and gamma rays
- absorption of ionizing radiation by matter and the biological effects on living
- X-ray equipment
- gamma ray sources
- comparison of X-ray and gamma ray sources on basis of energy and intensity
- shielding thickness
- exposure calculations
- reciprocity law
- preparation and use of exposure charts, radiographic equivalence charts
- exposure techniques
- equipment types
- recording and reporting
- safety aspects
- types of materials
- industrial applications
- set-up procedures
- methods/procedures for reporting test results
- implications of test results for the particular material/application
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards

REQUIRED SKILLS AND KNOWLEDGE

- use and application of personal protective equipment
- safe work practices and procedures
- 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 be able to perform basic radiographic testing. 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 basic radiographic testing procedures in a range of industrial applications, 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

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.	
Preparation processes	Surface cleaning and drying
Obvious discontinuities	Observed changes in material homogeneity

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing
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MEM24010B Perform radiographic testing

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers operating radiographic testing equipment and applying the testing procedures in a range of industrial applications.
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Application of the Unit

Application of the unit	<p>This unit applies to inspecting, interpreting, classifying and reporting on radiographic testing techniques of fabrications, structures and components.</p> <p>Testing is across a wide range of industries to Level 2 (AS 3669 and AS 3998) or equivalent and includes identifying abnormalities such as corrosion, metal fatigue, deformation in non-ferrous/ferrous alloys steels, composite materials, fatigue cracks, stress corrosion cracking, manufacturing defects, thickness measurement and fit, mechanical and bonded repairs, welding defects and casting defects and/or aircraft components.</p> <p>The work can relate to scheduled and un-scheduled maintenance activities using general tools and specific radiographic testing equipment as specified in maintenance documentation, testing procedures or operators instructions.</p> <p>Actual and potential defects are to be considered, together with ongoing abnormalities in fabrications, components and structures on a wide range of applications. Radiographic tests are performed on critical component or structural zones, and may require re-assessment of competency at regular intervals in accordance with Australian standards and/or other relevant standards. All testing must be completed with particular attention to personal and OH&S regulations.</p> <p>Ionizing radiation equipment materials and chemicals, which are subject to codes and regulations, must be stored,</p>
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	<p>used, and transported in accordance with safe work practices. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>Where power tools are required, Unit MEM18002B (Use power tools/hand held operations) should also be selected.</p> <p>Where tests require the interpretation of drawings, Unit MEM09002B (Interpret technical drawings) should also be selected.</p> <p>Band:</p> <p>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).</p> <p>Unit Weight: 6</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM13013B	Work safely with ionizing radiation
	MEM18001C	Use hand tools
	MEM24012C	Apply metallurgy principles

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare inspection areas for radiographic testing	<p>1.1. Inspection areas are identified, cleaned and prepared for testing using appropriate procedures and materials.</p> <p>1.2. Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements.</p> <p>1.3. Inspection areas are visually assessed and obvious discontinuities are identified.</p>
2. Select and prepare radiographic test	<p>2.1. The most appropriate radiographic test for the material/application is selected.</p> <p>2.2. Appropriate testing and processing equipment is selected and set up for various geometries in accordance with standards and/or procedures.</p> <p>2.3. Quality of radiographic test is optimised.</p>
3. Perform radiographic testing	<p>3.1. Radiographic tests are carried out in accordance with relevant standards, codes, specifications and OH&S requirements.</p> <p>3.2. Radiographs are set up and carried out for specialised applications.</p> <p>3.3. Films are processed to maximise quality of image.</p> <p>3.4. Films are processed to achieve optimum results.</p>
4. Maintain radiographic testing equipment	<p>4.1. Radiographic testing equipment is checked for defects, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions.</p>
5. Monitor and ensure radiation safety	<p>5.1. Safety controls are set up and maintained.</p> <p>5.2. Exposure to radiation employees and general public is minimised.</p> <p>5.3. Radiation monitoring equipment is selected and</p>

ELEMENT	PERFORMANCE CRITERIA
	used.
6. Interpret and report the results of radiographic tests	6.1. Conditions necessary to view and interpret radiographs are established. 6.2. Radiographs are interpreted/evaluated in accordance with applicable codes, standards and specifications. 6.3. Test results are reported in accordance with enterprise procedures, accepted industry practices and customer service 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:

- interpreting and following procedures
- identifying inspection areas
- identifying discontinuities and defects
- selecting appropriate testing techniques, equipment and procedures
- calculating and producing optimum quality radiographs
- effectively designing exposure and storage areas
- calculating shielding thicknesses
- reading, interpreting and applying relative testing standards
- reading, interpreting and applying relative conformance standards
- documenting and reporting
- assessing risk

Required knowledge

Look for evidence that confirms knowledge of:

- cleaning and preparation processes for a range of test surfaces
- cleaning and preparation processes for a range of test surfaces
- assessment procedures and techniques
- types of discontinuities and their consequences/effect on the material
- procedure for carrying out each radiographic test
- principal types of X-ray generators and radioisotopes and their effect on

REQUIRED SKILLS AND KNOWLEDGE

- radiographic sensitivity
- tools, equipment, techniques and system verification checks
- relevant standards, regulations and codes
- hazards associated with radiographic testing
- procedures for specialised radiographic applications
- principles of image formation, film and chemical properties and processing techniques
- various types of films and screens, their properties and effects on image quality
- maintenance and storage procedures for test equipment
- common faults and damage
- safety features of radioisotope cameras and X-ray equipment
- production of X-rays and gamma rays
- absorption of ionizing radiation by matter and the biological effects on living
- X-ray equipment
- gamma ray sources
- comparison of X-ray and gamma ray sources on basis of energy and intensity
- shielding thickness
- exposure calculations
- reciprocity law
- preparation and use of exposure charts, radiographic equivalence charts.
- exposure techniques
- equipment types
- recording and reporting
- safety aspects
- types of materials
- industrial applications
- set-up procedures
- methods/procedures for reporting test results
- implications of test results for the particular material/application
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- use and application of personal protective equipment
- safe work practices and procedures
- relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	<p>A person who demonstrates competency in this unit must be able to perform radiographic testing. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p>
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating radiographic testing equipment and applying testing procedures or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>

EVIDENCE GUIDE

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.

Preparation processes	Surface cleaning and drying
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Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Non-destructive testing
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MEM24011B Establish non-destructive tests

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers researching, analysing, developing, approving and evaluating non-destructive tests (NDT).
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Application of the Unit

Application of the unit	<p>This unit applies to research, development, approval and evaluation of applicable non-destructive tests on fabrications, structures and components across a wide range of industries to Level 3 (AS 3669 and AS 3998) or equivalent.</p> <p>The work can relate to scheduled and unscheduled maintenance activities using general tools and specific testing equipment, test development procedures or guidelines. Activities should replicate 'in-service' tasks due to the high level of self-supervision and the critical nature of the work.</p> <p>Actual and potential defects are considered, together with ongoing abnormalities in fabrications, components, structures from a wide range of applications by the selection of relevant testing method. Tests are validated/evaluated on critical component or structural zones. All testing must be developed and completed with particular attention to personal safety and OH&S regulations. Certification against Australian standards may be achieved where assessment in this unit of competency is carried out in conjunction with an examining authority as described in ISO 9712.</p> <p>Materials and chemicals which are subject to codes and regulations - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - are subject to safe work habits and must be stored and used in accordance with safe work practices.</p> <p>This unit should not be selected when Unit MEM05025C</p>
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	(Perform welding fabrication inspection) has already been selected. Band: B Unit Weight: 12
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM13013B	Work safely with ionizing radiation
	MEM16010A	Write reports
	MEM18001C	Use hand tools
	MEM24002B	Perform penetrant testing
	MEM24004B	Perform magnetic particle testing
	MEM24006B	Perform eddy current testing
	MEM24008B	Perform ultrasonic testing
	MEM24010B	Perform radiographic testing
	MEM24012C	Apply metallurgy principles

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Assess requirements for non-destructive test	<p>1.1. Inspection area is assessed for testing and all possible failure sites are identified utilising metallurgical analysis.</p> <p>1.2. Relevant information for test development is collected from available sources using accepted techniques.</p> <p>1.3. Information is analysed and interpreted.</p> <p>1.4. Test requirements are determined.</p>
2. Establish non-destructive test techniques and procedures	<p>2.1. Test methods, techniques and procedures to be used for specific NDT work are designated.</p> <p>2.2. Codes, standards, specifications and procedures are interpreted.</p> <p>2.3. Test procedures are developed in accordance with established techniques and metallurgical principles.</p>
3. Validate/confirm non-destructive tests	<p>3.1. General and specific test procedures are validated in accordance with established techniques.</p> <p>3.2. Inspection results are interpreted and evaluated in terms of existing codes, standards and specifications.</p>
4. Approve non-destructive test procedures	<p>4.1. Procedures are approved in accordance with workplace procedures and relevant codes and standards.</p> <p>4.2. Procedures are documented and distributed in accordance with workplace requirements and relevant codes and standards.</p>
5. Evaluate non-destructive test procedures	<p>5.1. Procedures are evaluated for effectiveness.</p> <p>5.2. Evaluation results are documented and reported according to workplace requirements.</p> <p>5.3. Changes/amendments to non-destructive test</p>

ELEMENT	PERFORMANCE CRITERIA
	procedures are made and distributed as necessary.

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:

- conducting metallurgical assessment of inspection areas
- designating most appropriate method, technique or procedure
- referencing information
- developing and validating test procedures
- applying safety procedures, standard operating procedures and legislative requirements to all work
- reading/interpreting/applying relative testing standards
- reading/interpreting/applying relative conformance standards
- documenting procedure and results

Required knowledge

Look for evidence that confirms knowledge of:

- application of metallurgical analysis to assess inspection areas
- NDT methods, techniques and procedures
- meaning and validity of relevant codes, standards, specifications and procedures
- test procedure for testing techniques and specimen
- validation processes
- process for approval of procedures
- process for documentation/distribution of procedures
- evaluation procedures
- process for documentation of evaluation results
- process for amending tests and distributing amendments
- any applicable industry standards, national/Australian standards, NOHSC guides, State/Territory regulatory codes of practice/standards
- use and application of personal protective equipment
- safe work practices and procedures
- relevant hazards and control measures related to the competency

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	<p>A person who demonstrates competency in this unit must be able to establish non-destructive tests. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p>
Context of and specific resources for assessment	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the research, analysis, development, approval and evaluation of non-destructive tests, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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</p>

EVIDENCE GUIDE	
	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	
<p>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.</p>	

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing
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MEM24012C Apply metallurgy principles

Modification History

Single band identifier removed to clarify dual status

Unit Descriptor

Unit descriptor	This unit covers applying basic metallurgy principles related to selecting appropriate non-destructive testing techniques (NDT) and interpreting the results of NDT tests for metallurgical processes.
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Application of the Unit

Application of the unit	<p>This unit applies to knowledge of metallurgy principles, and the relationship between the various non-destructive testing methods and their capabilities and limitations when applied to the detection of specific discontinuities in metals and alloys.</p> <p>The unit applies to employees other than NDT technicians such as metallurgists, welding supervisors etc. who select and order NDT tests and who interpret results provided by tests for metal manufacturing, casting, shaping, and joining processes. The unit does not apply to the conduct of NDT tests.</p> <p>Such variables as the type of discontinuity, manufacturing process and limitations will assist in determining the sequence of testing and the ultimate selection of one non-destructive test method in preference to another. Any testing that may be carried out must be completed with particular attention to personal and OH&S regulations.</p> <p>Where materials and chemicals which are subject to codes and regulations are stored and used - for example, chemicals, explosives, solvents, dangerous materials, acids, or noxious waste products - safe work habits must be considered.</p> <p>Band:</p> <p>This unit has dual status and is to be regarded as both a Specialisation band A unit and Specialisation band B unit</p>
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	for progression to C5 (AQF level V).
	Unit Weight: 4

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
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ELEMENT	PERFORMANCE CRITERIA
1. Interpret and apply the principles of solidification and crystal structures in metals and alloys	1.1.Principles of solidification and crystal structures in metals and alloys are interpreted and applied in relation to NDT techniques.
2. Interpret equilibrium diagrams for metals and alloys	2.1.Equilibrium diagram for metal or alloy is correctly sourced 2.2.Equilibrium diagrams are correctly interpreted.
3. Interpret and apply the principles of fusion welding of metals and alloys	3.1.Principles and methods for fusion welding of metals and alloys are applied to NDT test selection. 3.2.Defects in weldments are identified and classified from NDT test results.
4. Interpret and apply the principles of the formation of castings	4.1.Principles and methods used to produce metal castings are applied to NDT test selection. 4.2.Defects in metal and alloy castings are identified and classified from NDT test results.
5. Interpret and apply the principles of steel forging	5.1.Principles and methods used to produce steel forgings are applied to NDT test selection. 5.2.Defects in steel forgings are identified and classified from NDT test results.
6. Interpret and apply the principles of mechanical testing	6.1.Principles of mechanical testing are applied to NDT test selection. 6.2.Defects in metal product are identified and classified from NDT test results

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:

- research
- understanding and applying metallurgy principles
- selecting NDT test appropriate to metal or alloy and manufacturing process

REQUIRED SKILLS AND KNOWLEDGE**Required knowledge**

Look for evidence that confirms knowledge of:

- principles of solidification and crystal structures in metal:
 - classification of materials
 - structure of atoms
 - process of solidification
 - crystal structures
 - defects formed during solidification
 - modification of crystal structure
 - heat treatment processes
 - defects formed during heat treatment
- meaning of equilibrium diagrams representative of a range of metals including aluminium, iron, steel and common non-ferrous alloys:
 - alloy systems
 - solid and liquid solubility
 - basic equilibrium diagrams
 - equilibrium diagrams for common alloys
- principles of fusion welding in relation to NDT testing
- defects in fusion welding:
 - processing defects
 - grinding cracks
 - pickling cracks
 - heat treatment cracks
 - service defects
 - fatigue cracks
 - corrosion and stress corrosion cracks
- principles of the formation of castings
- defects in castings
- principles of steel forging
- defects in steel forging
- principles of mechanical testing:
 - mechanical testing
 - tensile testing
 - impact testing
 - hardness testing
 - fatigue testing
- other tests

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to apply metallurgy principles to NDT test selection and interpretation. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying basic metallurgy principles as related to non-destructive testing techniques, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>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</p>

EVIDENCE GUIDE	
	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	
<p>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.</p>	
Principles and methods for fusion welding of metals and alloys	<ul style="list-style-type: none"> • MMAW • SAW • GMAW • GTAW • FCAW
Defects in weldments	Cracks, lack of fusion, cavities, imperfect shape, solid inclusions, miscellaneous
Defects in metal and alloy castings	Shrinkage cavities, hot tears, cold cracks, gas holes
Principles and methods used to produce steel forgings	Deformations, strengthening mechanisms, annealing
Principles of mechanical testing	Impact, tensile, hardness testing

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Non-destructive testing
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MEM30007A Select common engineering materials

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers recognising common materials used in engineering, assisting in the selection of a material for a specific application, and using test results to evaluate the properties of materials.
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Application of the Unit

Application of the unit	<p>This unit applies to technician level activities in manufacturing and engineering environments.</p> <p>Work is carried out under supervision.</p> <p>Band: 0</p> <p>Unit Weight: 0</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify common engineering materials by their principal properties	<p>1.1. The principal properties of ferrous and non-ferrous metals are identified.</p> <p>1.2. The principal properties of thermosetting and thermoplastic polymers are identified.</p> <p>1.3. The principal properties of ceramics and composite materials are identified.</p> <p>1.4. The effects of different types of bonding in materials are identified.</p> <p>1.5. The effects of mechanical and thermal processes on the principal properties of materials are identified.</p>
2. Select materials for specific applications	<p>2.1. The engineering requirement for the specific application is determined in consultation with others.</p> <p>2.2. Material is selected based on the requirement and consideration of principal properties and further processing.</p> <p>2.3. Selection is confirmed according to standard operating procedures.</p>
3. Verify selected material as fit for purpose	<p>3.1. Appropriate tests for the required properties are identified.</p> <p>3.2. Testing of materials is arranged with appropriate persons, if necessary.</p> <p>3.3. Test results are analysed and material choices are</p>

ELEMENT	PERFORMANCE CRITERIA
	confirmed or modified as appropriate.

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:

- undertaking research
- selecting/carrying out tests appropriate to the material
- communicating
- documenting
- planning and sequencing operations
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents

Required knowledge

Look for evidence that confirms knowledge of:

- classification of materials:
 - metals and non-metals
 - ferrous and non-ferrous metals
 - polymers (thermoplastics, thermosetting and elastomers)
 - ceramics
 - composite materials
- structure of materials
- physical properties of materials:
 - electrical conductivity/resistivity
 - specific gravity/density
 - thermal conductivity/expansion
 - specific heat
 - melting/boiling points
- magnetic properties
- optical properties
- mechanical properties:

REQUIRED SKILLS AND KNOWLEDGE

- strength - yield, tensile, compressive
- stress/strain data
- hardness
- toughness (impact and slow strain)
- elasticity
- plasticity
- ductility
- malleability
- fatigue
- creep
- chemical properties:
 - corrosion of metals, corrosion processes, mechanisms
 - degradation of polymers
- materials testing methods - destructive testing and applications:
 - tensile
 - compressive
 - shear
 - torsion
 - hardness
 - impact
 - fatigue
 - creep
 - visual
 - corrosion testing
- engineering materials
- engineering applications of ferrous metals:
 - cast irons
 - carbon and alloy steels
 - stainless steels
- engineering applications of non-ferrous metals:
 - aluminium and its alloys
 - copper, brass and bronze
 - nickel alloys, zinc, titanium
 - magnesium
 - refractory metals
- engineering applications of polymers:
 - thermosetting polymers
 - thermoplastic polymers

REQUIRED SKILLS AND KNOWLEDGE

- ceramics and glasses
- effects of mechanical and thermal processes on the properties of materials:
 - casting
 - forging, rolling and extrusion
 - cold forming
 - powder processes
 - heat treatment
 - joining - fasteners
 - soldering
 - brazing
 - welding
 - adhesives
 - finishing - coatings, metallic and non-metallic
- hazards and control measure associated with selecting common engineering materials, 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 select common engineering materials.
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

EVIDENCE GUIDE	
	<p>unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with selecting common engineering materials, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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 and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Common engineering materials	<p>Includes ferrous metals, cast irons, carbon and alloy steels, stainless steels, coated steels, non-ferrous metals, aluminium and its alloys, copper and its alloys, nickel alloys, zinc, titanium, magnesium, refractory metals, polymers,</p>

RANGE STATEMENT	
	thermosetting polymers, thermoplastic polymers, ceramics and glasses
Appropriate tests	Tests which can be undertaken by a technician within the organisation as well as those required to be undertaken by external organisations, including simple tests
Required properties	Properties to be tested include tensile strength, compression, shear characteristics, torsion, hardness, impact resistance, fatigue resistance, creep resistance, visual appearance and colour, magnetic properties, corrosion resistance
Appropriate persons	Internal technicians and/or external organisations

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Engineering technician
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MEM30012A Apply mathematical techniques in a manufacturing engineering or related environment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers applies the <i>concepts of mathematics</i> to appropriate and simple engineering situations within the individual's area of engineering expertise.
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Application of the Unit

Application of the unit	This unit applies to technician level work that requires basic algebraic, trigonometric and statistical knowledge and skill. Band: 0 Unit Weight: 4
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use concepts of arithmetic in the solution of engineering problems	1.1.Units of physical quantities are converted to facilitate engineering calculations. 1.2.Calculations are performed to solve problems involving rational and irrational numbers. 1.3.Scientific notation is used to represent numbers. 1.4.Calculations are checked for reasonableness using estimating and approximating techniques.
2. Solve engineering problems involving algebraic expressions with one independent variable	2.1.Algebraic expressions are manipulated using mathematical operations in their correct order.
3. Use two-dimensional geometry to solve practical problems	3.1.Angles expressed in degrees are correctly converted to radians and vice versa. 3.2.The perimeter, area, length and angles of a range of two-dimensional figures are correctly calculated. 3.3.The volume and surface area of complex figures are correctly calculated. 3.4.Points identified in terms of cartesian coordinates can be converted to polar coordinates and vice versa.
4. Use trigonometry to solve practical	4.1.Basic trigonometry functions are used to calculate the lengths of the sides of right-angled triangles.

ELEMENT	PERFORMANCE CRITERIA
problems	4.2. Inverse trigonometry functions are used to determine angles in a right-angled triangle given the lengths of two sides. 4.3. The sine rule is used to determine the lengths of the sides of acute and obtuse angled triangles given one side and two angles. 4.4. The cosine rule is used to determine the lengths of the sides of acute and obtuse angled triangles given two sides and one angle.
5. Graph linear functions	5.1. Linear functions are solved graphically and equations of straight lines are determined from the slope and one point, or two points. 5.2. Two linear functions are solved simultaneously both algebraically and geometrically. 5.3. The length and mid point of a line segment are determined.
6. Solve quadratic equations	6.1. Quadratic equations are solved. 6.2. Simultaneous linear and quadratic equations are solved.
7. Perform basic statistical calculations	7.1. Mean, median and mode are calculated from given data. 7.2. Standard deviation is calculated and interpreted employing graphical representation.

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:

- using and applying mathematical formulas:
 - logical thinking
 - problem solving
 - calculating
 - applying statistics

REQUIRED SKILLS AND KNOWLEDGE
<ul style="list-style-type: none"> • using computer numerical methods • drawing graphs
Required knowledge
<p>Look for evidence that confirms knowledge of:</p> <ul style="list-style-type: none"> • transposing and evaluating formulae • polynomials • straight line coordinate geometry • introduction to indices • introduction to trigonometry • circular functions • trigonometry of oblique triangles • trigonometric identities • introduction to functions and their graphs

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	<p>A person who demonstrates competency in this unit must be able to apply mathematical skills and knowledge to simple engineering applications. Evidence from tasks and projects should/may be used to complement and demonstrate integration of competency.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p>
Context of and specific resources for assessment	<p>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</p>

EVIDENCE GUIDE	
	<p>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.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying mathematical concepts to engineering applications, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>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.</p>
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Concepts of mathematics	<p>Include arithmetic, algebraic expressions with one independent variable, two-dimensional geometry, trigonometry, linear functions, basic quadratic functions, basic statistical methods</p>

RANGE STATEMENT	
Correct order	Refers to the correct procedure when expanding brackets, factorising algebraic expressions, factorising quadratic expressions, simplifying algebraic fractions, transposing formulae, solving simple one variable equations, finding the quotient and remainder given a linear division
Complex figures	May include cones, pyramids, spheres, frustums and intersections of figures singularly or in combination

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Engineering technician
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MSAENV272B Participate in environmentally sustainable work practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	<p>This competency covers the outcomes required to effectively measure current resource use and carry out improvements including those reducing negative environmental impacts of work practices.</p> <p>This unit is based on the sustainability guideline standard GCSSUS01A Participate in environmentally sustainable work practices.</p>
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Application of the Unit

Application of the unit	<p>This competency applies to operators/team members who are required to follow procedures so as to work in an environmentally sustainable manner. This ensures regulatory compliance and also aims at minimising environmental risks and maximises the environmental performance of the process and the organisation.</p> <p>It includes:</p> <ul style="list-style-type: none"> • Resources used • Potential environmental hazards • Improving environmental performance (within scope of competency and authority). <p>This competency applies to all sectors of the manufacturing industry and members of its value chain. It may also be applied to all sections of an organisation, including office, warehouse etc. This unit will need to be appropriately contextualised as it is applied across an</p>
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	organisation and across different industry sectors.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has no prerequisites	

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify current resource use and environmental issues.	1.1. Identify workplace <i>environmental and resource efficiency issues</i> . 1.2. Identify resources used in own work role. 1.3. <i>Measure</i> and record current usage of resources using <i>appropriate techniques</i> .

ELEMENT	PERFORMANCE CRITERIA
	1.4. Identify and report workplace environmental hazards to appropriate personnel.
2. Comply with environmental regulations.	2.1. Follow <i>procedures</i> to ensure <i>compliance</i> . 2.2. Report environmental incidents to appropriate personnel.
3. Seek opportunities to improve environmental practices and resource efficiency.	3.1. Follow <i>enterprise plans</i> to improve environmental practices and resource efficiency. 3.2. Make <i>suggestions</i> for improvements to workplace practices in own work area.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include the ability to:

- report as required by procedures
- follow procedures and instructions and respond to change
- ask questions and seek clarifications relating to work requirements

Reading and writing is required in order to interpret required procedures and complete required workplace forms/reports.

Numeracy is required to interpret numeric workplace information, readings and measurements, handle data as required and complete numeric components of workplace forms/reports.

Required knowledge

Competency includes sufficient knowledge to:

- have a basic understanding of sustainability
- know the environmental hazards/risks, resource use and inefficiencies associated with own workplace (at an appropriate level)
- know the relevant environmental and resource efficiency systems and procedures for own work area
- know the impact of laws and regulations to a level relevant to the work context

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competence in this unit must be able to provide evidence of the ability to follow workplace procedures according to instructions given and to participate in the improvement of environmental and resource efficient work practices at own level of responsibility. Evidence must be strictly relevant to the particular workplace role.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:</p> <ul style="list-style-type: none"> • identify and measure resources used in their job • identify situations likely to lead to an environmental incident • follow procedures related to environmental performance. <p>Consistent performance should be demonstrated. For example, look to see that:</p> <ul style="list-style-type: none"> • work is routinely to procedures • the minimum of resources is used consistent with the job requirements, good practice and the procedures.
<p>Context of and specific resources for assessment</p>	<p>Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.</p> <p>Depending on the selected methods of assessment access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans • documentation in relation to production, waste, overheads, hazard control/management • reports from supervisors/managers • case study/scenarios
<p>Method of assessment</p>	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed:</p> <ul style="list-style-type: none"> • by demonstration in the workplace

EVIDENCE GUIDE	
	<ul style="list-style-type: none"> • using targeted questioning for appropriate portions • by use of a suitable simulation and/or a range of case studies/scenarios • by a combination of these techniques. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment.</p>
Guidance information for assessment	Assessors need to be aware of any cultural issues that may affect responses to questions. Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Procedures	All operations are performed in accordance with procedures including all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.
Environmental and resource efficiency issues	<p>Environmental and resource efficiency issues include minimisation of environmental risks and maximisation of opportunities to improve business environmental performance and to promote more efficient production and consumption of natural resources, for example by:</p> <ul style="list-style-type: none"> • minimisation of waste, through implementation of the waste management hierarchy

RANGE STATEMENT	
	<ul style="list-style-type: none"> • efficient and effective use of energy and other resources • seeking alternative sources of energy • efficient use of materials and appropriate disposal of waste • use of controls to minimise the risk of environmental damage from hazardous substances • efficient water use • reducing emissions • life cycle analysis applied to issues such as energy supply, materials, transport, production
Measure	<p>Measure should be interpreted in a manner consistent with the scope of the job and may include things like:</p> <ul style="list-style-type: none"> • counting the number of items entering/leaving a work area • reading indicators in the work area • obtaining relevant information from support personnel • other simple means
Appropriate techniques	<p>Appropriate techniques include:</p> <ul style="list-style-type: none"> • material fed to/consumed by plant/equipment • plant meters and gauges • job cards including kanbans • examination of invoices from suppliers • measurements made under different conditions • examination of relevant information and data.
Compliance	<p>Compliance includes meeting relevant federal, state and local government laws, by-laws, regulations and mandated codes of practice. It also includes any codes and standards that the enterprise applies voluntarily.</p>
Incidents	<p>Incidents include:</p> <ul style="list-style-type: none"> • breaches or potential breaches of regulations • occurrences outside of standard procedure which may lead to lower environmental performance.
Enterprise plans	<p>Enterprise plans include:</p>

RANGE STATEMENT	
	<ul style="list-style-type: none"> • documented policies and procedures • work plans to minimise waste, increase efficiency of water/energy use, minimise environmental hazards
Suggestions	<p>Suggestions include ideas that help to:</p> <ul style="list-style-type: none"> • prevent and minimise environmental risks and maximise opportunities • reduce emissions of greenhouse gases • reduce use of non-renewable resources • improve energy efficiency • increase use of renewable, recyclable, reusable and recoverable resources • reduce waste • increasing the reusability/recyclability of wastes/products • reduce water usage and/or water wastage.

Unit Sector(s)

Unit sector	
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Competency field

Competency field	Competitive manufacturing tools
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Co-requisite units

Co-requisite units	

MSAENV472B Implement and monitor environmentally sustainable work practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	<p>This competency covers the outcomes required to effectively analyse the workplace in relation to environmentally sustainable work practices and to implement improvements and monitor their effectiveness.</p> <p>This unit is based on the sustainability guideline standard GCSSUS02A Implement and monitor environmentally sustainable work practices.</p>
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Application of the Unit

Application of the unit	<p>This competency applies to those who have responsibility for a specific area of work or who lead a work group or team. It addresses the knowledge, processes and techniques necessary to implement and monitor environmentally sustainable work practices, including the development of processes and tools.</p> <p>It includes:</p> <ul style="list-style-type: none"> • Identifying areas for improvement • Developing plans to make improvements • Implementing and monitoring improvements in environmental performance. <p>This competency applies to all sectors of the manufacturing industry and members of its value chain. It may also be applied to all sections of an organisation, including office, warehouse etc. This unit will need to be appropriately contextualised as it is applied across an organisation and across different industry sectors.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has no prerequisites	

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Investigate current practices in relation to resource usage.	1.1 Identify environmental regulations applying to the enterprise. 1.2 Assess procedures for assessing <i>compliance</i> with environmental regulations. 1.3 Collect information on environmental and resource efficiency systems and procedures, and provide to the work group where appropriate. 1.4 Measure and record current resource usage by members of the work group.

ELEMENT	PERFORMANCE CRITERIA
	1.5 Analyse and record current purchasing strategies. 1.6 Analyse current work processes to access information and data and assist in identifying areas for improvement.
2. Set targets for improvements.	2.1 Seek input from stakeholders, key personnel and specialists. 2.2 Access external sources of information and data as required. 2.3 Evaluate alternative solutions to workplace environmental issues. 2.4 Set efficiency targets.
3. Implement performance improvement strategies.	3.1 Source <i>techniques/tools</i> to assist in achieving targets. 3.2 Apply continuous improvement strategies to own work area of responsibility and communicate ideas and possible solutions to the work group and management. 3.3 Integrate environmental and resource efficiency improvement plans for own work group with other operational activities and implement them. 3.4 Seek suggestions and ideas about environmental and resource efficiency management from stakeholders and act upon them where appropriate. 3.5 Implement costing strategies to fully value environmental assets.
4. Monitor performance.	4.1 Document outcomes and communicate reports on targets to key personnel and stakeholders. 4.2 Evaluate strategies. 4.3 Set new targets and investigate and apply new tools and strategies. 4.4 Promote successful strategies and reward participants where possible.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

REQUIRED SKILLS AND KNOWLEDGE

- using relevant environmental and resource efficiency systems, tools and procedures
- applying quality assurance systems relevant to own work area
- applying relevant supply chain procedures
- measurement and calculation techniques
- communication/consultation skills to ensure information is supplied to the work group

Reading and writing is required to comprehend documentation and interpret environmental and energy efficiency requirements and to document and maintain records

Numeracy is required to interpret numeric workplace information, readings and measurements, handle data as required and complete numeric components of workplace forms/reports.

Required knowledge

Required knowledge includes:

- how to access and use relevant environmental and resource efficiency systems, tools and procedures
- understanding of best practice approaches relevant to own area of responsibility
- strategies to maximise opportunities and minimise impacts relevant to own work area
- relevant environmental and resource efficiency issues specific to industry practices
- methods for measuring and calculating resource usage

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 competence in this unit must be able to provide evidence of the ability to implement and monitor integrated environmental and resource efficiency management policies and procedures within an organisation.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

EVIDENCE GUIDE	
	<ul style="list-style-type: none"> • monitor and investigate current resource usage • develop plans to improve sustainability • implement environmental improvements. <p>Consistent performance should be demonstrated. For example, look to see that:</p> <ul style="list-style-type: none"> • environmental performance is routinely monitored and investigated • areas for improvements are followed through and the implemented changes are in turn monitored and investigated.
Context of and specific resources for assessment	<p>This section should be read in conjunction with the range of variables for this unit of competency. Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.</p> <p>Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation.</p> <p>A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed:</p> <ul style="list-style-type: none"> • by demonstration in the workplace • using targeted questioning for appropriate portions • through use of specific project(s) • by use of a suitable simulation and/or a range of case studies/scenarios • by a combination of these techniques. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or</p>

EVIDENCE GUIDE	
	similar assessment.
Guidance information for assessment	<p>Assessors need to be aware of any cultural issues that may affect responses to questions.</p> <p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>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.</p>	
Procedures	<p>All operations are performed in accordance with procedures.</p> <p>Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.</p> <p>Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.</p>
Environmental and resource efficiency issues	<p>Environmental and resource efficiency issues include:</p> <ul style="list-style-type: none"> • addressing environmental and resource sustainability initiatives such as Environmental Management Systems, action plans, surveys and audits • reference to standards, guidelines and approaches such as: <ul style="list-style-type: none"> • ISO 14001 Environmental Management Systems • Life Cycle Analyses

RANGE STATEMENT	
	<ul style="list-style-type: none"> • Cradle to cradle • Global Reporting Initiative • Ecological footprinting • Triple Bottom Line reporting • Product Stewardship • determining enterprise's most appropriate waste treatment including waste to landfill, recycling, re-use and wastewater treatment • applying the waste management hierarchy in the workplace • initiating and/or maintaining appropriate enterprise procedures for operational energy consumption, including stationary energy and non stationary (transport) • efficient use of water • minimising greenhouse gas emissions • use of controls to minimise the risk of environmental damage from hazardous substances
Measure	<p>Measuring techniques include:</p> <ul style="list-style-type: none"> • material fed to/consumed by plant/equipment • plant meters and gauges • job cards including kanbans • examination of invoices from suppliers • measurements made under different conditions • examination of relevant information and data • others as appropriate to the specific industry contexts.
Techniques and tools	<p>Techniques and tools may includeÂ : </p> <ul style="list-style-type: none"> • visual workplace concepts • measurement, display and/or recording devices • changed work practices/procedures • competence development and awareness training • process and equipment items
Compliance	<p>Compliance includes meeting relevant federal, state and local government laws, by-laws, regulations and codes of practice.</p>
Incidents	<p>Incidents include:</p>

RANGE STATEMENT	
	<ul style="list-style-type: none"> • breaches or potential breaches of regulations • occurrences outside of standard procedure which may lead to lower environmental performance
Purchasing strategies	<p>Purchasing strategies include:</p> <ul style="list-style-type: none"> • influencing suppliers to take up environmental sustainability • selecting materials/components with a lower environmental profile.
Stakeholders, key personnel and specialists	<p>Stakeholders, key personnel and specialists include individuals and groups both inside and outside the organisation that have some direct interest in the enterprise's conduct, actions, products and services, including:</p> <ul style="list-style-type: none"> • employees at all levels of the organisation • customers • suppliers • other organisations • key personnel within the organisation, and specialists outside it who may have particular technical expertise
Suggestions	<p>Suggestions includes ideas that help to:</p> <ul style="list-style-type: none"> • prevent and minimise environmental risks and maximise opportunities • reduce emissions of greenhouse gases • reduce use of non-renewable resources • make more efficient use of energy, water and other resources • maximise opportunities to re use and recycle materials • identify strategies to offset or mitigate environmental impacts. e.g. purchasing of carbon credits • express purchasing power through the selection of suppliers with improved environmental performance. e.g. purchasing renewable energy and materials with lower embedded carbon • eliminate the use of hazardous and toxic materials increasing the reusability/recyclability of wastes/products.

Unit Sector(s)

Unit sector	
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Competency field

Competency field	Competitive manufacturing tools
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Co-requisite units

Co-requisite units		

MSAENV672B Develop workplace policy and procedures for environmental sustainability

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	<p>This competency covers the outcomes required to develop and implement a workplace sustainability policy, including the modification of the policy to suit changed circumstances.</p> <p>This unit is based on the sustainability guideline standard GCSSUS03A Develop workplace policy and procedures for sustainability.</p>
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Application of the Unit

Application of the unit	<p>This competency applies to team leaders/supervisors/managers who are required to develop approaches to environmental sustainability within workplaces, including the development and implementation of policy.</p> <p>It includes:</p> <ul style="list-style-type: none">• Communicating with relevant stakeholders• Developing and monitoring sustainability policies• Reviewing and improving sustainability policies. <p>This competency applies to all sectors of the manufacturing industry. It may also be applied to all sections of an organisation, including office, warehouse etc.</p> <p>This unit will need to be appropriately contextualised as it is applied across an organisation and across different industry sectors.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has no prerequisites	

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Develop workplace sustainability policy.	1.1 Define <i>scope of sustainability policy</i> . 1.2 Identify and consult <i>stakeholders</i> as a key component of the policy development process. 1.3 Review environmental sustainability <i>strategies</i> relevant to all stages of work covered by the policy 1.4 Make recommendations for policy options based on likely effectiveness, timeframes and cost. 1.5 Develop policy is that reflects the organisation's commitment to sustainability as an integral part of the

ELEMENT	PERFORMANCE CRITERIA
	business planning and as a business opportunity. 1.6 Agree upon appropriate methods of implementation.
2. Communicate the policy.	2.1 Promote the policy, including its expected outcome to key stakeholders. 2.2 Inform those involved in implementing the policy as to outcomes expected, activities to be undertaken and responsibilities assigned.
3. Implement the policy.	3.1 Develop and communicate procedures to help implement the policy. 3.2 Implement <i>strategies</i> for continuous improvement in resource efficiency. 3.3 Establish record systems for tracking continuous improvements in sustainability approaches and assign responsibilities.
4. Review policy implementation	4.1 Record outcomes and provide feedback to key personnel and stakeholders. 4.2 Investigate success or otherwise of policy. 4.3 Monitor records to identify trends that may require remedial action, and use to promote continuous improvement of performance. 4.4 Modify policy and or <i>procedures</i> as required to ensure improvements are made.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- developing and implementing systems and procedures to aid in the achievement of sustainability in the workplace
- applying quality assurance systems relevant to own enterprise
- accessing and applying other relevant enterprise policies, procedures and protocols
- relevant industry competency
- interpreting business/strategic plans

This unit requires the ability to:

REQUIRED SKILLS AND KNOWLEDGE

- read and evaluate complex and formal documents such as policy and legislation
- research, analyse and present information
- prepare written reports requiring precision of expression and language and structures suited to the intended audience
- adjust communication to suit different audiences
- deal with different points of view and dissenting stakeholders.

Required knowledge

Required knowledge includes:

- understanding of relevant policy development and implementation processes and practices
- understanding of the principles, practices and available tools and techniques of sustainability management relevant to the particular industry context
- best practice approaches relevant to own work area
- equal employment opportunity, equity and diversity principles and occupational health and safety implications of policy/s being developed

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 competence in this unit must be able to provide evidence of the ability to develop and implement integrated sustainability policies and procedures within an enterprise. The review of the policy after implementation will also need to be evidenced.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- develop relevant policy and procedures that comply with the regulatory requirements and business plans
- develop a workable implementation strategy
- include measurable criteria for reviewing improvement.

Consistent performance should be demonstrated. For

EVIDENCE GUIDE	
	<p>example, look to see that:</p> <ul style="list-style-type: none"> • policy implementation is reviewed • policy is developed to become part of the routine practices of the organisation.
Context of and specific resources for assessment	<p>This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation.</p> <p>A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<p>Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.</p> <p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed:</p> <ul style="list-style-type: none"> • by demonstration in the workplace • using targeted questioning for appropriate portions • through use of specific project(s) • by use of a suitable simulation and/or a range of case studies/scenarios • by a combination of these techniques. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment.</p>
Guidance information for assessment	<p>Assessors need to be aware of any cultural issues that may affect responses to questions.</p> <p>Assessment processes and techniques must be culturally</p>

EVIDENCE GUIDE

	appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.
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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.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Scope of sustainability policy

Scope of sustainability policy include:

- The area/s of environmental sustainability to be targeted and whether social and economic sustainability will be incorporated
- The parts of the enterprise to which it is to apply, including whether it is for the whole enterprise, one site, one work area or combinations of these
- An investigation of the particular business and market context of the industry/ enterprise
- Addressing sustainability initiatives through reference to standards, guidelines and approaches such as:
 - ISO 14001 Environmental Management Systems
 - Life Cycle Analyses

RANGE STATEMENT	
	<ul style="list-style-type: none"> • Cradle to grave/cradle to cradle • Global Reporting Initiative • Ecological Footprint Assessment • Triple Bottom Line reporting • Product Stewardship.
Stakeholders	<p>Stakeholders include individuals and groups both inside and outside the organisation that have some direct interest in the enterprise's conduct, actions, products and services, including:</p> <ul style="list-style-type: none"> • employees at all levels of the organisation • customers • suppliers • regulators • other organisations.
Strategies	<p>Implementation strategies include:</p> <ul style="list-style-type: none"> • awareness raising among stakeholders • training of staff in principles and techniques of sustainability • promotional activities. <p>Continuous improvement strategies include ongoing measuring, improving and monitoring such as:</p> <ul style="list-style-type: none"> • Plan, do, check, act cycles • Kaizen (continuous improvement) • Kaizen blitz (breakthrough improvement event) • Six sigma approaches <p>Environmental sustainability strategies include:</p> <ul style="list-style-type: none"> • reducing toxic material and hazardous chemical use • minimising resource use through changes in processes, facility design and management • supply chain and life cycle management approaches • sourcing renewable energy and low carbon footprint materials • reducing, re-using, recycling and waste

RANGE STATEMENT	
	reduction <ul style="list-style-type: none"> • product and process improvements • carbon offsets • reducing greenhouse gas and other emissions

Unit Sector(s)

Unit sector	
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Competency field

Competency field	Competitive manufacturing tools
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Co-requisite units

Co-requisite units		

MSFSF2001 Cut single layer fabrics

Modification History

Release 1 - New unit of competency

Application

This unit of competency covers measuring out and cutting single layer fabrics for manufacture of curtains and soft furnishing accessories. It does not apply to cutting from patterns.

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

Pre-requisite Unit

Competency Field

Unit Sector

Soft Furnishing

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|---|----------------------|-----|--|
| 1 | Plan work operations | 1.1 | Required fabrics, number of items to be cut and required equipment are identified |
| | | 1.2 | Fabric sizes to be cut are identified from work order plus any required allowances |
| | | 1.3 | Work health and safety (WHS) requirements, including ergonomic criteria and personal protection needs, are observed throughout the work. |
| | | 1.4 | Suitable work area is selected, tidied and cleaned of any contaminants |
| | | 1.5 | Suitable scissors and/or blades are selected and checked prior to use for appropriate sharpness, set, operation and safe condition |

- | | | | |
|---|-------------------------------|-----|--|
| | | 1.6 | Fabrics are selected in accordance with work order and laid out smooth and square |
| 2 | Prepare materials for cutting | 2.1 | Fabrics are inspected for flaws and appropriate finish |
| | | 2.2 | Naps, direction, pattern matches and face of the materials are identified |
| | | 2.3 | Tools and equipment are checked for operation |
| 3 | Complete cutting operations | 3.1 | Cutting is completed with cut out materials identified/labelled where required |
| | | 3.2 | Any measurements for pleat lines, hems, headings and any special seam allowances are marked out using workplace approved methods |
| | | 3.3 | Where required, fabrics are hung using appropriate protective covers and care label information is attached |
| | | 3.4 | Cut lengths are despatched to next process following workplace procedures |
| | | 3.5 | Unused materials are stored as required |
| | | 3.6 | Workplace required documentation is completed following appropriate procedures |
| | | 3.7 | Work area is cleaned and damaged tools tagged as required |
| | | 3.8 | Waste is collected and bundled for recycling/re-use as required |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency. Detail on appropriate performance levels for each furnishing unit of competency in reading, writing, oral communication and numeracy utilising the Australian Core Skills Framework (ACSF) are provided in the Furnishing Training Package Implementation Guide.

Range of Conditions

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. Range is restricted to essential operating conditions and any other variables essential to the work environment.

- Unit context includes:**
- WHS requirements, including legislation, building codes, material safety management systems, hazardous and dangerous goods codes, and local safe operating procedures or equivalent
 - work is carried out in accordance with legislative obligations, environmental legislation, relevant health regulations, manual handling procedures and organisation insurance requirements
 - work requires individuals to demonstrate some discretion, judgement and problem solving
- Tools and equipment include:**
- cutting equipment, including scissors and cutting machines
 - measuring and calculating equipment:
 - tapes
 - rulers
 - calculators and computers
- Products to be constructed include:**
- curtains
 - drapes
 - swags
 - cushions
 - upholstered furniture components
- Personal protective equipment includes:**
- that prescribed under legislation, regulations and enterprise policies and practices
- Information and procedures include:**
- workplace procedures relating to the use of tools and equipment
 - work instructions, including job sheets, cutting lists, plans, drawings and designs
 - workplace procedures relating to reporting and communication
 - manufacturer specifications and operational procedures

Unit Mapping Information

Supersedes and is equivalent to LMFSF2001B Cut single layer fabrics.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=0601ab95-583a-4e93-b2d4-cfb27b03ed73>

Assessment Requirements for MSFSF2001 Cut single layer fabrics

Modification History

Release 1 - New unit of competency

Performance Evidence

- Interpret work order and locate and apply relevant information
- Apply safe handling requirements for equipment, products and materials, including use of personal protective equipment
- Identify materials used in the work process
- Follow work instructions, operating procedures and inspection processes to:
 - minimise the risk of injury to self or others
 - prevent damage to goods, equipment and products
 - maintain required production output and product quality
- Identify materials used and any special marking out requirements
- Measure accurately and cut fabric quantities to minimise waste and produce consistent quality items for at least five (5) different types of material or product
- Use mathematical ideas and techniques to correctly complete measurements, calculate area and estimate material requirements
- Communicate ideas and information to enable confirmation of work requirements and specifications and the reporting of work outcomes and problems, interpret basic plans and follow safety procedures
- Avoid backtracking, work flow interruptions or wastage
- Work with others and in a team by recognising dependencies and using cooperative approaches to optimise work flow and productivity

Knowledge Evidence

- Work requirements, including workplace standards
- Fabric types, common faults and inspection procedures
- Design features of the finished items in relation to attractive use of fabric patterns
- Cutting equipment and techniques
- Effect of cutting on fabrics

Assessment Conditions

- Assessors must:
 - hold training and assessment competencies as determined by the National Skills Standards Council (NSSC) or its successors

- have vocational competency in the furnishing industry at least to the level being assessed with broad industry knowledge and experience, usually combined with a relevant industry qualification
- be familiar with the current skills and knowledge used and have relevant, current experience in the furnishing industry.
- Assessment methods must confirm consistency of performance over time rather than a single assessment event and in a range of workplace relevant contexts.
- Assessment must be by observation of relevant tasks with questioning on underpinning knowledge and, where applicable, multimedia evidence, supervisor's reports, projects and work samples.
- Assessment is to be conducted on single units of competency or in conjunction with other related units of competency. Foundation skills are integral to competent performance in the unit and should not be assessed separately.
- Assessment must occur on the job or in a workplace simulated facility with relevant process, equipment, materials, work instructions and deadlines.
- Access is required to fabrics, including linings and interlinings, calculator and other workplace calculating and cutting equipment.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=0601ab95-583a-4e93-b2d4-cfb27b03ed73>

MSFSF2002 Machine sew materials

Modification History

Release 1 - New unit of competency

Application

This unit of competency covers using sewing machines for production of soft furnishings, mattresses and bases, and upholstered furniture.

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

Pre-requisite Unit

Competency Field

Unit Sector

Soft Furnishing

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|---|---|
| 1 Identify sewing machine equipment controls and procedures | 1.1 Job requirements are identified from work instructions |
| | 1.2 Work health and safety (WHS) requirements, including ergonomic criteria and personal protection needs, are observed throughout the work |
| | 1.3 Equipment components, equipment condition and controls are identified |
| | 1.4 Operating procedures are checked to identify any approved adjustments |
| | 1.5 Equipment operations and production procedures are identified |
| | 1.6 The process for obtaining materials and moving products |

- to the next process is identified
- 2 Prepare for work
 - 2.1 Work order or sample is checked to identify sewing specifications
 - 2.2 Required materials, tools and equipment are assembled
 - 2.3 Materials and equipment are inspected and any faults are identified and reported
 - 2.4 Work sequence is planned to suit job, and materials are laid out
 - 2.5 If required, naps, pattern direction and face side of materials are identified
 - 2.6 Components are matched and secured with tacking, pins or adhesives as required
 - 2.7 Any required supplementary equipment is identified for routine lubrication and adjustments
 - 3 Set up and control sewing machine operations
 - 3.1 Sewing machine is set up and adjusted
 - 3.2 Sewing operation is according to workplace procedures and material characteristics
 - 3.3 Required product quality and outputs are maintained
 - 4 Maintain quality requirements
 - 4.1 Machining process is monitored and conditions which may affect work quality are reported
 - 4.2 Authorised changes in operating procedures are implemented
 - 5 Finish and despatch work
 - 5.1 Completed work is checked for required quality, finished as required, and repaired, where applicable, before moving to the next process
 - 5.2 Material which is able to be re-used is collected and stored
 - 5.3 Equipment and work area clean up and waste management are completed following workplace procedures
 - 5.4 Workplace records are completed as required

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency. Detail on appropriate performance levels for each furnishing unit of competency in reading, writing, oral communication and numeracy utilising the Australian Core Skills Framework (ACSF) are provided in the Furnishing Training Package Implementation Guide.

Range of Conditions

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. Range is restricted to essential operating conditions and any other variables essential to the work environment.

- Unit context includes:**
- WHS requirements, including legislation, building codes, material safety management systems, hazardous and dangerous goods codes, and local safe operating procedures or equivalent
 - work is carried out in accordance with legislative obligations, environmental legislation, relevant health regulations, manual handling procedures and organisation insurance requirements
 - work requires individuals to demonstrate some discretion, judgement and problem solving
- Sewing specifications include:**
- required materials
 - threads and additional work features
 - seam and stitch specifications
 - any special stitch requirements and allowances
 - shape characteristics and special requirements
 - needles
 - attachments and ancillary equipment
 - quality requirements
- Sewing products include:**
- top stitching
 - gathering
 - piping
 - braid
 - fringe
 - flange cords
 - straight fabric lengths
 - padded material
 - loose covers
- Sewing processes**
- hemming

- include:**
- seams
 - machine tacking
 - gathering
 - multiple-layer sewing
 - straight or zig zag sewing
- Machines include:**
- single or multi-needle flat bed
 - overlocker
 - blind hemming
 - gathering
 - flange
 - bar tacking
 - tape edging
- Sewing machine set-up and adjustment includes:**
- thread machine and wind bobbin as required
 - set required tensions
 - select required machine settings
 - test operations for work order requirements
- Materials to be machined include:**
- plain fabrics
 - patterned fabrics
- Personal protective equipment includes:**
- that prescribed under legislation, regulations and enterprise policies and practices
- Information and procedures include:**
- workplace procedures relating to the use of tools and equipment
 - work instructions, including job sheets, cutting lists, plans, drawings and designs
 - workplace procedures relating to reporting and communication
 - manufacturer specifications and operational procedures

Unit Mapping Information

Supersedes and is equivalent to LMFSF2002B Machine sew materials.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=0601ab95-583a-4e93-b2d4-cfb27b03ed73>

Assessment Requirements for MSFSF2002 Machine sew materials

Modification History

Release 1 - New unit of competency

Performance Evidence

- Interpret work order and locate and apply relevant information
- Apply safe handling requirements for equipment, products and materials, including use of personal protective equipment
- Identify materials used in the work process
- Follow work instructions, operating procedures and inspection processes to:
 - minimise the risk of injury to self or others
 - prevent damage to goods, equipment and products
 - maintain required production output and product quality
- Identify and operate three (3) types of industrial sewing machines, including set up of the sewing machine for operation and monitoring the quality of output
- Use mathematical ideas and techniques to correctly complete measurements, calculate area and estimate material requirements
- Communicate ideas and information to enable confirmation of work requirements and specifications and the reporting of work outcomes and problems, interpret basic plans and follow safety procedures
- Avoid backtracking, work flow interruptions or wastage
- Work with others and in a team by recognising dependencies and using cooperative approaches to optimise work flow and productivity

Knowledge Evidence

- Types, characteristics, uses and limitations of sewing machines
- Characteristics of materials used and finished products
- Safety and environmental aspects of sewing machine operations
- Quality systems and standards for soft furnishings
- Work flow requirements for sewing process
- Operation of work systems and industrial sewing equipment
- Causes of faults and repair methods in soft furnishing machining
- Procedure for reporting damaged or imperfect products or interruptions to work flow

Assessment Conditions

- Assessors must:
 - hold training and assessment competencies as determined by the National Skills Standards Council (NSSC) or its successors

- have vocational competency in the furnishing industry at least to the level being assessed with broad industry knowledge and experience, usually combined with a relevant industry qualification
- be familiar with the current skills and knowledge used and have relevant, current experience in the furnishing industry.
- Assessment methods must confirm consistency of performance over time rather than a single assessment event and in a range of workplace relevant contexts.
- Assessment must be by observation of relevant tasks with questioning on underpinning knowledge and, where applicable, multimedia evidence, supervisor's reports, projects and work samples.
- Assessment is to be conducted on single units of competency or in conjunction with other related units of competency. Foundation skills are integral to competent performance in the unit and should not be assessed separately.
- Assessment must occur on the job or in a workplace simulated facility with relevant process, equipment, materials, work instructions and deadlines.
- Access is required to appropriate industrial sewing machines, operating procedures, materials and threads.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=0601ab95-583a-4e93-b2d4-cfb27b03ed73>

MSFUP3012 Apply marine sewing and installation techniques

Modification History

Release 1 - New unit of competency

Application

This unit of competency covers using marine sewing techniques in the completion of upholstery products/items used in marine applications, such as covers, and fitting the required attachments and fixing devices.

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

Pre-requisite Unit

Competency Field

Unit Sector

Upholstery

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|---|------------------|-----|---|
| 1 | Prepare for work | 1.1 | Job requirements are identified from work instructions |
| | | 1.2 | Work health and safety (WHS) requirements, including personal protection needs, are observed throughout the work |
| | | 1.3 | Machines, attachments, materials, work method and sequence are determined |
| | | 1.4 | Equipment, including any supplementary equipment, is identified and checked for safe operation, components and controls |
| | | 1.5 | Materials are identified and inspected and problems, including any materials or part-constructed products which |

- do not meet the job order requirements, are identified and reported in accordance with workplace procedures
- 1.6 Work pieces are laid out in sequence in accordance with specifications and workplace procedures
- 2 Conduct sewing operation
- 2.1 Sewing machine, including attachments, as required, set-up requirements and adjustments are observed in accordance with workplace procedures
- 2.2 Appropriate thread type and size is fitted to machine
- 2.3 Machine is operated to maintain required product quality and outputs
- 2.4 Reinforcing/protective measures, fittings/attachments and fixing devices are attached in accordance with workplace procedures
- 2.5 Finished products, including covers, are inspected for quality with unacceptable items being reprocessed in accordance with workplace instructions
- 3 Complete work
- 3.1 Unused materials are stored, as required
- 3.2 Workplace required documentation, including stock usage, is completed and processed following workplace procedures
- 3.3 Work area is cleaned and damaged tools and equipment tagged, as required
- 3.4 Waste is collected and bundled for recycling/reuse as required by workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency. Detail on appropriate performance levels for each furnishing unit of competency in reading, writing, oral communication and numeracy utilising the Australian Core Skills Framework (ACSF) are provided in the Furnishing Training Package Implementation Guide.

Range of Conditions

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. Range is restricted to essential operating conditions and any other variables essential to the work environment.

- Unit context includes:**
- WHS requirements, including legislation, building codes, material safety management systems, hazardous and dangerous goods codes, and local safe operating procedures or equivalent
 - work is carried out in accordance with legislative obligations, environmental legislation, relevant health regulations, manual handling procedures and organisation insurance requirements
 - work requires individuals to demonstrate some discretion, judgement and problem solving
- Fittings/attachments and fixing devices include:**
- clips
 - press studs
 - buckles
 - eyelets
 - shackles
 - zips
 - reinforcing patches
 - straps
- Job requirements include:**
- required materials
 - threads
 - additional work features
 - shape and special requirements for the item
 - any required workplace documentation to be completed
- Machines include:**
- overlocker
 - flat bed
 - twin needle and walking foot
- Tools and equipment include:**
- measuring tape
 - scissors
 - cutting blades
 - knives and thread
- Materials include:**
- canvas
 - sail materials
 - leather
 - foam-backed vinyl and upholstery fabrics

Personal protective equipment includes:

- that prescribed under legislation, regulations and enterprise policies and practices:
 - safety glasses/goggle
 - hair nets
 - ear muffs/plugs
 - gloves
 - footwear and protective clothing

Information and procedures include:

- workplace procedures relating to the use of tools and equipment
- work instructions, including job sheets, cutting lists, plans, drawings and designs
- workplace procedures relating to reporting and communication
- manufacturer specifications and operational procedures

Unit Mapping Information

Supersedes and is equivalent to LMFUP3012B Apply marine sewing and installation techniques.

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=0601ab95-583a-4e93-b2d4-cfb27b03ed73>

Assessment Requirements for MSFUP3012 Apply marine sewing and installation techniques

Modification History

Release 1 - New unit of competency

Performance Evidence

- Interpret work order and locate and apply relevant information
- Apply safe handling requirements for equipment, products and materials, including use of personal protective equipment
- Identify materials used in the work process
- Follow work instructions, operating procedures and inspection processes to:
 - minimise the risk of injury to self or others
 - prevent damage to goods, equipment and products
 - maintain required production output and product quality
- Prepare and install a minimum of three (3) square metres of cover to at least three (3) vertical or horizontal surfaces
- Sew at least three (3) covers and sew appropriate fasteners and attachments to covers sewn
- Use mathematical ideas and techniques to correctly complete measurements, calculate area and estimate material requirements
- Communicate ideas and information to enable confirmation of work requirements and specifications and the reporting of work outcomes and problems, interpret basic plans and follow safety procedures
- Avoid backtracking, work flow interruptions or wastage
- Work with others and in a team by recognising dependencies and using cooperative approaches to optimise work flow and productivity

Knowledge Evidence

- Procedure for reporting damaged or imperfect products or interruption to work flow
- Work flow requirements for sewing process
- Operation of work systems and sewing equipment
- Characteristics of materials used and application and requirements of the finished products
- Causes of faults and repair methods
- Identification of equipment, processes and procedures
- Quality systems and standards
- Workplace procedures

Assessment Conditions

- Assessors must:
 - hold training and assessment competencies as determined by the National Skills Standards Council (NSSC) or its successors
 - have vocational competency in the furnishing industry at least to the level being assessed with broad industry knowledge and experience, usually combined with a relevant industry qualification
 - be familiar with the current skills and knowledge used and have relevant, current experience in the furnishing industry.
- Assessment methods must confirm consistency of performance over time rather than a single assessment event and in a range of workplace relevant contexts.
- Assessment must be by observation of relevant tasks with questioning on underpinning knowledge and, where applicable, multimedia evidence, supervisor's reports, projects and work samples.
- Assessment is to be conducted on single units of competency or in conjunction with other related units of competency. Foundation skills are integral to competent performance in the unit and should not be assessed separately.
- Assessment must occur on the job or in a workplace simulated facility with relevant process, equipment, materials, work instructions and deadlines.
- Access is required to appropriate sewing machine, work orders, materials, fittings and threads.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=0601ab95-583a-4e93-b2d4-cfb27b03ed73>

PMBPROD262B Operate tyre curing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the operation of tyre curing equipment in a tyre manufacturing plant or retreading situation where the 'green' tread is laid on the tyre casing.

Application of the Unit

Application of this unit

This competency applies to operators who are involved in curing 'green' tyres and 'hot cap' retreads (ie retreads made using green treads), assembled from a number of intermediate components and stored. This competency is typically performed by operators working independently.

The operator:

- takes product off machine
- checking product for quality and conformity to specifications
- checks raw material feed
- notices any problems and takes required action (eg reporting)
- deal with non-conforming products, waste and scrap
- complete logs and reports.

This unit does not include the use of pre-cured treads - see *PROD263A Operate retread curing equipment*

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Check work requirements.	1.1 Identify work requirements from production plan or request. 1.2 Check product, materials and equipment meet requirements for job(s). 1.3 Recognise requirements which may not be in accordance with usual practice. 1.4 Ask questions of appropriate person to confirm unusual practice. 1.5 Identify hazards associated with the job and take appropriate action. 1.6 Perform other pre-operational checks in accordance with procedures.
2. Start up tyre curing equipment to procedures.	2.1 Conduct pre-start checks. 2.2 Start up tyre curing equipment.
3. Operate equipment to procedures.	3.1 Start machine safely and correctly when required. 3.2 Check process is operating within required limits.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	3.3 Check product is in specification and to required quality standard. 3.4 Ensure product is consistently ready for next operation. 3.5 Maintain supply of material(s) as required. 3.6 Complete logs and records when as required. 3.7 Collect and segregate scrap, trim and other materials as required in accordance with procedures. 3.8 Keep equipment and work area clean area in accordance with procedures. 3.9 Pause machine cycle and perform emergency stop, as required by procedures.
4. Respond to routine problems in accordance with procedures.	4.1 Recognise known faults that occur during the operation. 4.2 Identify and take action on causes of routine faults. 4.3 Log problems as required. 4.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of an operational knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults. For example temperature measurements are essential for curing of tyres, where the temperature must be kept constant during the process. Monitoring the temperature inside the mould is too difficult; therefore the temperature of the condensate is monitored using specialised equipment.

Knowledge of organization procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the tyre curing process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge of and skills in the operation of tyre curing equipment and main components sufficient for consistent production of quality products including:

- production workflow sequences and materials demand
- the reasons for checking process control panels and reporting readings which are outside of normal range of process variability
- accurately monitoring equipment operation and product quality
- the potential effects of variations in raw materials and equipment operation in relation to quality of product
- processing behaviour of polymers and the role of additives
- waste management and knowing the importance of reusing non-conforming products wherever possible
- correct selection and use of equipment, materials, processes and procedures
- explain the effect of unauthorised or emergency shutdown in relation to safety and production requirements
- identify factors which may affect product quality or production output and appropriate remedies.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify when the operator is able to rectify faults, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the curing process.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

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.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- apply the required skills and knowledge to operate a tyre curing machine
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that:

- tyre curing production standards are met consistently
- all safety procedures are followed.

Assessment method and context

Assessment will occur on an industrial curing machine(s) equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, industrial tyre curing machine requiring demonstration of operation and emergency stop procedures
- in a situation allowing for the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. Add any 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.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency unit includes curing operations.

This competency applies to all work environments within the tyre manufacture sector. It also includes the operation of all relevant ancillary equipment.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- curing press (eg bagomatic, collapsible bladder or shear strip, solid bladder)
- ancillary equipment (eg screens/strainers, computer data systems, ball float steam traps, condensate temperature and steam trap monitoring system)
- curing agents (eg sulphur sources, peroxides, metal oxides, amines, and phenolic resins)
- relevant personal protective equipment.

Hazards

Typical hazards include:

- manual handling
- noise
- humidity
- temperatures (eg from air and steam)
- fumes/vapours (eg from curing agents)
- cleaning equipment (eg screens/strainers)
- stationary and moving machinery.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process problems may include:

- poorly aligned guides
- mould incorrectly placed on machine
- poor mould closure/alignment
- poorly prepared mould (dirty/mould release)
- incorrect temperature settings
- mould temperature/steam pressure/air blinded/waterlogged
- mould/air pressure.

Typical product problems may include:

- contaminated green tyres
- squashed or distorted green tyres
- scorched rubber
- curing time/cycle

- product
- excessive trim/spue
- out of round/eccentric.
-

Unit Sector(s)

Not applicable.

PMBPROD263B Operate retread curing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the operation of tyre curing equipment in retreading workplaces where pre-vulcanised tread is laid on the retread tyre.

Application of the Unit

Application of this unit

This competency applies to operators who are involved in curing retread tyres assembled from a prepared carcass and a pre-vulcanised tread. This competency is typically performed by operators working independently.

The operator:

- takes product off the machine
- checking product for quality and conformity to specifications
- checks raw material feed
- notices any problems and takes required action (eg reporting)
- deal with non-conforming products, waste and scrap
- complete logs and reports.

This unit does not include retread processes where the green extruded tread is laid onto the buffed casing. This unit also does not include:

- inspection - see *PROD324 Inspect tyres for retreading*
- preparation - see *PROD266 Prepare tyre casings for retreading*
- laying retreads - see *PROD325A Lay on tyre retreads*
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Check production plan.	1.1 Identify work requirements from production plan or request. 1.2 Check product, materials and equipment meet requirements for job(s). 1.3 Recognise requirements which may not be in accordance with usual practice. 1.4 Ask questions of appropriate person to confirm unusual practice 1.5 Identify hazards associated with the job and take appropriate action. 1.6 Perform other pre-operational checks in accordance with procedures.
2. Prepare retreads for	2.1 Check stretch height and roundness of tyres.

ELEMENT ELEMENT	PERFORMANCE CRITERIA
curing to procedures.	2.2 Insert equipment used to pressurise inside of tyre to specifications. 2.3 Place tyre within rubber envelope.
3. Start up retread curing equipment to procedures.	3.1 Conduct pre-start checks. 3.2 Start up retread curing equipment.
4. Operate equipment to procedures.	4.1 Check process is operating within required limits. 4.2 Check product is in specification and to required quality standard. 4.3 Ensure product is consistently ready for next operation. 4.4 Maintain supply of material(s) as required. 4.5 Complete logs and records as required. 4.6 Collect and segregate scrap, trim and other materials as required. 4.7 Keep equipment and work area clean. 4.8 Pause machine cycle and perform emergency stop, as required.
5. Respond to routine problems in accordance with procedures.	5.1 Recognise known faults that occur during the operation. 5.2 Identify and take action on causes of routine faults. 5.3 Log problems as required. 5.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of an operational knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults. For example high pressure is required to secure the retread and cushion gum to the casing to ensure adequate bonding. Therefore the correct amount of pressure applied by such equipment as envelopers and sealing rings needs to be monitored.

Knowledge of organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the retread curing process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge of and skills in the operation of retread curing equipment and main components sufficient for consistent production of quality products including:

- production workflow sequences and materials demand
- the reasons for checking process control panels and reporting readings which are outside of normal range of process variability
- accurately monitoring equipment operation and product quality
- the potential effects of variations in raw materials and equipment operation in relation to quality of product
- processing behaviour of polymers and the role of additives
- waste management and knowing the importance of reusing non-conforming products wherever possible
- correct selection and use of equipment, materials, processes and procedures
- explain the effect of unauthorised or emergency shutdown in relation to safety and production requirements
- identify factors which may affect product quality or production output and appropriate remedies.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify when the operator is able to rectify faults, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the retreading process.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, e.g. to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

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.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- apply the required skills and knowledge to operate retread curing equipment
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that:

- retread curing production standards are met consistently
- all safety procedures are followed.

Assessment method and context

Assessment will occur on an industrial retread curing machine(s) equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using appropriate, industrial retread curing equipment requiring demonstration of operation and emergency stop procedures
- in a situation allowing for the generation of evidence of the ability to respond to problems
 - by using a suitable simulation and/or a range of case studies/scenarios
 - through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. Add any 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.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency unit includes curing operations in retreading operations. Curing is mainly of bonding agents.

This competency applies to most work environments within the tyre retreading sector, but does not include retread processes where the green extruded tread is laid onto the buffed casing. It includes the operation of all relevant additional equipment where that equipment is integral to the retreading process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- autoclave (such as electric and steam curing chambers)
- envelopers
- sealing rings
- prepared casings
- relevant personal protective equipment.

Hazards

Typical hazards include:

- manual handling
- noise
- humidity
- temperatures (such as from air and steam)
- fumes/vapours
- hazards from high pressures
- stationary and moving machinery, parts and components

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process problems may include:

- equipment malfunction
- high humidity in curing oven
- air not being extracted properly from the envelope
- air blinding of steam equipment
- material contamination
- contaminated treads
- poorly prepared/contaminated casing
- poor quality bonding material
- curing time/cycle
- incorrect temperature settings
- incorrect air pressure settings.

Typical product problems may include:

- poor product finish
- poor binding of retread to buffed casing
- excessive trim/spue
- out of round/eccentric.
-

Unit Sector(s)

Not applicable.

PMBPROD264C Check recycle wash process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the use of recycle wash equipment and checking of the process.

Application of the Unit

Application of this unit

This competency applies to operators who are required to use recycle wash equipment and checking of the process. This competency is typically performed by operators working either independently or as part of a work team.

The operator will:

- discuss work progress with other team members
- ensure appropriate raw materials are available
- check the operation of the process
- check product for quality and conformity to specifications
- complete logs and reports.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Check work requirements.	1.1 Identify work requirements from workplace approved operating procedures. 1.2 Recognise requirements which may not be in accordance with usual practice. 1.3 Ask questions of appropriate person to confirm unusual practice. 1.4 Ensure housekeeping is to requirements. 1.5 Identify hazards associated with the job and take appropriate action.
2. Conduct pre-checks as required.	2.1 Inspect and sample products in line with workplace procedures. 2.2 Check equipment components and component function is to the required quality standard. 2.3 Check and test fluid circuits, pumps, shutoffs and control valves.
3. Operate recycle washer equipment in accordance with procedures.	3.1 Start machine safely and correctly when required. 3.2 Check process is operating with required limits. 3.3 Collect product samples and store. 3.4 Check product is in specification / to required quality standard. 3.5 Maintain supply of material(s) as required.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	3.6 Complete logs and records as required. 3.7 Collect and reprocess/discard scrap/trim and other materials in accordance with workplace procedures. 3.8 Check readouts against standard statistical process information and enter production data into the control system. 3.9 Keep equipment and work area clean. 3.10 Pause machine cycle and perform emergency stop, as required.
4. Identify product quality requirements.	4.1 Check process and note conditions which may affect product quality standards. 4.2 Interpret reports from quality inspections and rectify or report as appropriate equipment conditions within workplace procedures. 4.3 Note and implement authorised changes in standard operating procedures and specifications.
5. Respond to routine problems in accordance with procedures.	5.1 Recognise known faults that occur during the operation. 5.2 Identify and take action on causes of routine faults. 5.3 Log problems as required. 5.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults.

A knowledge of organisation procedures, relevant regulatory requirements and the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the recycle wash process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge of and skills in the operation of recycle wash equipment and its main components sufficient for consistent production of quality products including:

- impact of incorrect or faulty materials
- focus of operation of work systems and equipment
- hazards of the materials and process and appropriate hazard control procedures
- accurately monitor equipment operation
- identify factors which may affect product quality or production output and appropriate remedies
- explain the effect of unauthorised or emergency shutdown in relation to safety and production requirements.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify when the operator is able to rectify problems, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the recycle wash process.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

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.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- apply the required skills and knowledge to operate recycle wash equipment
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that recycle wash standards are met consistently.

Assessment method and context

Assessment will occur on industrial equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, operating plant requiring demonstration of operation and emergency stop procedures
- in a situation allowing for the generation of evidence of the ability to respond to problems
 - by using a suitable simulation and/or a range of case studies/scenarios
 - through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. Add any 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.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency applies to all work environments and sectors within the plastics industry. It includes the operation of all relevant ancillary equipment.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- hand carts and trolleys and other manual handling aids
- knives and basic hand tools required for opening of material packaging
- hoists/lifting equipment not requiring any special permits or licences
- bung spanners and similar
- relevant personal protective equipment.

Hazards

Typical hazards include:

- spills
- hazardous materials
- moving equipment
- manual handling hazards.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- equipment malfunction
- variations in materials or contamination of materials.
- incorrect raw materials/additives
- incorrect quantity of materials/additives.

Appropriate action for non-routine problems may be reporting to designated person or other action specified in procedures.

Unit Sector(s)

Not applicable.

PMBPROD265C Operate portable vulcanising equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the application of technical expertise, work planning and problem solving to set up and operate portable vulcanising equipment.

This competency is typically performed by operators working either independently or as part of a work team.

Application of the Unit

Application of this unit

This competency applies to operators who set up and operate portable vulcanising equipment either in a production facility or an on-site work environment. The key factors are the establishment of the appropriate safe working environment, obtaining the necessary power and other supplies, conducting vulcanising operations and assessing and taking appropriate action at the end of the operations.

It includes:

- planning the curing job
- identifying hazards and applying appropriate controls
- obtaining all necessary clearances and permissions for site work
- setting up equipment and materials
- conducting vulcanising operations
- assessing the finished work and identifying and taking action on routine process problems
- completing logs and reports.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Identify work requirements for vulcanising operations.	1.1 Identify the job and vulcaniser characteristics and product quality outcomes required. 1.2 Obtain specifications relevant to the material being vulcanised. 1.3 Identify and obtain equipment and materials required for the vulcanising process. 1.4 Identify hazards associated with the job and take appropriate action. 1.5 Check materials, ancillary supplies, and equipment for quality, access and condition. 1.6 Identify and check emergency stops, gauges, guards and controls.
2. Plan vulcanising operations.	2.1 Identify time, pressure and temperature requirements. 2.2 Plan the task sequences 2.3 Plan for waste management, maintenance and housekeeping requirements.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
3. Prepare vulcanising equipment.	3.1 Check vulcaniser, ancillary, equipment and attachments are fit for purpose. 3.2 Set up vulcanising press according to procedures. 3.3 Set equipment control parameters to specifications. 3.4 Obtain appropriate clearances for vulcanising to commence.
4. Conduct and monitor vulcanising operations.	4.1 Start the unit and commence vulcanising. 4.2 Monitor the unit operation throughout the entire process 4.3 Note and report non-conformity to specifications to procedures. 4.4 Make adjustments as required. 4.5 Shut down unit when cycle completed. 4.6 Follow procedure to disassemble equipment as required. 4.7 Assess the outcome of the vulcanising process and take remedial action as necessary and report to the appropriate person. 4.8 Brand splice as per company policy 4.9 Clean up, lubricate and adjust equipment as required. 4.10 Complete waste removal or recycling as required.
5. Respond to routine problems to procedure.	5.1 Recognise known faults that occur during the operation. 5.2 Identify and take action on causes of routine faults. 5.3 Log problems as required. 5.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults.

Knowledge of organization procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the vulcanising process. Application of approved hazard control, safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge of and skills in the operation of portable vulcanising equipment and main components sufficient for consistent production of quality products including:

- importance of correct selection and use of equipment, materials, processes and procedures
- identifying the function of vulcanising equipment, components and the materials used
- describing changes to materials during the vulcanising process
- explaining the impact of vulcanising speed, pressure, time, temperature and tension on product quality and production output
- describing the role of heat and pressure in relation to providing strength, stiffness, resistance to deformation, fatigue and abrasion
- explaining any differences in vulcanising processes and additives for natural, synthetic and mixed rubber compounds
- deciding if they (the operator) are able to rectify the fault or if assistance is required
- explaining the effect of unauthorised or emergency shutdown of equipment on the vulcanising process
- understand the underlying risks in the process and how best to manage them.

Competence includes the ability to:

- plan own work sequence, including identification of key checkpoints for equipment monitoring and product quality checks
- operate equipment and monitor product quality
- identify factors which may influence product quality and production output and appropriate remedies
- make appropriate authorised alterations to own work plan and equipment to maintain both product quality and required production output
- locate, interpret and apply relevant information and maintain workplace records
- identify and safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task.

Distinguish between causes of faults such as:

- equipment condition
- materials (eg. contaminated or wrong raw materials/additives/catalyst)
- process conditions (eg incorrect temperatures or pressures and entrapped air in the vulcanised area).

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is also required, eg to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

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.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- understand the inherent risk associated with using a vulcaniser and the potential consequences of incorrect use
- understand procedures
- understand the importance of critical material properties and quantities
- recognise potential situations requiring action
- implement appropriate action and explain logic.

Consistent performance should be demonstrated. For example, look to see that:

- production standards are met consistently
- wire or reinforcing is not visible in the finished product
- bonding is achieved in accordance with specifications.

Assessment method and context

Assessment will occur on industrial equipment in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, portable vulcanising equipment
- in a situation allowing for the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. Add any 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.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency applies to all work environments and sectors within the rubber industry. It includes the operation of all relevant additional equipment where that equipment is integral to the vulcanising process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This unit of competency includes use of equipment and tools such as:

- portable vulcanising equipment (including dispersion plates, pressure bags, edge bars, controllers)
- knives and other rubber cutting and shaping equipment
- hoists/lifting equipment not requiring any special permits or licences
- manual handling aids such as handcarts
- relevant personal protective equipment
- powered equipment/aids.

Hazards

Typical hazards include:

- pressure
- heat and hot rubber
- chemical splashes or spills
- dust or vapours/fumes
- manual handling hazards
- knife hazards.

Task sequences

Task sequences include:

- location of vulcaniser
- process monitoring
- quality checks.

Monitoring of vulcanisation

Monitoring of vulcanisation includes noting:

- times,
- vulcanisation quality,
- equipment operating temperatures and times
- additional pressures applied.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- incorrect vulcaniser set-up
- variations in materials
- contamination of materials
- unsuccessful vulcanising processes
- entrapped gasses
- wire or reinforcing exposure
- inappropriate material specification.

Variables

Key variables to be monitored include:

- heat
- pressure
- time
- tension.
-

Unit Sector(s)

Not applicable.

PMBPROD266B Prepare tyre casings for retreading

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the preparation (buffing) of used tyres prior to the laying on of retread. It applies to the tyre retreading sector of the industry.

Application of the Unit

Application of this unit

This competency applies to operators who buff residual tread from used tyres to prepare a carcass for laying retread. The key factors are the removal of sufficient but not excessive old rubber from the used tyre to establish a sound platform for the new tread. This competency is typically performed by operators working either independently or as part of a work team.

The operator will:

- check job sheets for work requirements
- check product for quality and conformity to specifications
- check materials required
- check machine set-up
- buff the tyre
- deal with non-conforming products, waste and scrap
- notice any problems and take required action (eg repair holes or areas where the steel radial becomes exposed)
- complete logs and reports.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Check work requirements.	1.1 Identify work requirements from production plan. 1.2 Identify specific requirements of the tyre being retreaded 1.3 Identify required equipment including handling, buffing, inspection and repair equipment. 1.4 Ask questions of appropriate person to confirm unusual practice. 1.5 Identify hazards associated with the job and take appropriate action. 1.6 Perform other pre-operational checks in accordance with procedures.
2. Start up of tyre buffer to procedures.	2.1 Conduct pre-start checks 2.2 Start up tyre buffer.
3. Operate buffing equipment to procedures.	3.1 Start machine safely and correctly when required. 3.2 Monitor buffing operations noting process stages, depth of cut (according to standard operating procedures) and abrasion.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	3.3 Check against workplace standards for colour and texture before completing process. 3.4 Make adjustments to remedy non-conformity to buffing requirements. 3.5 Buzz out areas around exposed steel radials with hand held stone grinder. 3.6 Collect and reprocess/discard scrap/trim and other materials, as required. 3.7 Keep equipment and work area clean. 3.8 Pause machine cycle and perform stop, as required.
4. Repair imperfections.	4.1 Locate casings imperfections from previous inspection. 4.2 Repair casings (especially exposed steel areas) with rubber plugs in accordance with standard operating procedures. 4.3 Complete logs and records as required.
5. Complete operations.	5.1 Check casings for compliance with specifications. 5.2 Create job card, tyre ID, other tracking/information items needed as specified by procedures. 5.3 Adhere the metal tag/s to the tyre wall with uncured rubber.
6. Respond to routine problems to procedures.	6.1 Recognise known faults that occur during the operation. 6.2 Identify and take action on causes of routine faults. 6.3 Log problems as required. 6.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults.

A knowledge of organization procedures, relevant regulatory requirements and the ability to implement them within appropriate time constraints and work standards. For example the minimum allowable depth of cover over the belt before retreading.

Application of the knowledge of managing risks using the hierarchy of controls applied to the buffing process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Show knowledge of and skills in the preparation of tyre casings for retreading and its main components sufficient for the consistent production of quality products including:

- different mould part types
- types of releasing agents
- role of releasing agents
- procedures
- factors which may affect product quality or production output and appropriate remedies

Competence includes knowledge of:

- production workflow sequences and materials demand
- the reasons for checking process controls
- the normal range of process variability
- the potential effects of variations in materials and equipment operation in relation to quality of product.
- purpose of the buffing and repair processes
- correct selection and use of equipment, materials, processes and procedures.

Competence also includes the ability to:

- check process controls and report readings which are outside the normal range of process variability
- identify factors which may affect product quality or production output and appropriate remedies
- recognise pre-cure retreads and cured recaps, remould retreads and the relevant procedures to buff casings for each type
- explain the effect of unauthorised or emergency shutdown in relation to safety and production requirements
- plan own work, including predicting consequences and identifying improvements
- accurately monitor equipment operation and product quality
- identify when the operator is able to rectify faults, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the preparation of tyre casing for retreading process.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, basic machine control panels, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

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.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- apply the required skills and knowledge to prepare tyre casings for retreading
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that production standards are met consistently.

Assessment method and context

Assessment will occur on an industrial buffing machine(s) equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate, industrial tyre buffing machine requiring demonstration of operation and start/stop procedures
- in a situation allowing for the generation of evidence of the ability to respond to problems
 - by using a suitable simulation and/or a range of case studies/scenarios
 - through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. Add any 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.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency unit includes the use of manual handling aids and various powered equipment/aids. This competency applies to work environments and sectors within the rubber industry. It includes the operation of all relevant ancillary equipment.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. These may include:

- movement of materials
- stacking of materials
- basic measurement of quantities
- basic pre-blending of materials.

Tools and equipment

This competency includes use of equipment and tools such as:

- hand carts and trolleys
- knives and other bag opening equipment
- hoists/lifting equipment not requiring any special permits or licences
- bung spanners and similar
- basic hand tools required for opening of material packaging
- relevant personal protective equipment.

Hazards

Typical hazards include:

- spills
- dusts/vapours
- hazardous materials (including rubber dust produced during the buffing process)
- manual handling hazards
- knife hazards.

Problems

Respond to routine problems' means 'apply known solutions to a variety of predictable problems'. Typical process and product problems may include:

- variations in tyres
- contamination of tyres
- damaged tyres.
- wrong raw materials
- inappropriate blade selection
- insufficient or too deep buffing.
-

Unit Sector(s)

Not applicable.

PMBPROD324B Inspect tyres for retreading

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the inspection of used tyres to determine their suitability for retreading and the resolving of routine and non-routine problems.

Application of the Unit

Application of this unit

This competency is typically performed by advanced operators applying knowledge of materials, product purpose and processes to the inspection of second hand tyres for defects that would preclude use as a retread. It also requires using a range of well developed skills requiring some discretion and judgment to recognise and resolve a range of problems.

The operator will:

- check settings and adjustments of inspection equipment
- inspect tyres by eye and/ or electronically
- repair minor holes and cracks in the casing
- solve inspection equipment and process problems, seeking guidance where necessary or appropriate.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

The required outcomes described in this unit contain applicable Employability Skills. The Employability Skills Summary of the qualification(s) in which this unit is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Plan own work requirements.	1.1 Identify the most appropriate equipment to be used for inspection and upstream and downstream operations from production plan or request. 1.2 Identify tyres to be inspected and check equipment to be used. 1.3 Implement measures to control identified hazards in line with procedures and duty of care.
2. Conduct tyre inspection.	2.1 Identify quality specifications and standard operating procedures for rejecting tyres for retreading 2.2 Check casings for conformity with specification requirements. 2.3 Tag tyres suitable for retreading following workplace procedures 2.4 Discard non-conforming tyres in accordance with workplace procedures. 2.5 Repair minor holes in casings of retreadables, as required. 2.6 Clean, adjust and lubricate equipment as required.

ELEMENT ELEMENT	PERFORMANCE CRITERIA
4. Anticipate and solve problems.	<p>Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.</p> <p>4.1 Recognise a problem or a potential problem. 4.2 Determine problems needing priority action. 4.3 Refer problems outside area of responsibility to appropriate person, with possible causes. 4.4 Seek information and assistance as required, to solve problems. 4.5 Solve problems within area of responsibility. 4.6 Follow through items initiated until final resolution has occurred.</p>

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of tyre construction and technology, inspection methods and equipment sufficient to recognise tyre conditions which may lead to out of specification retreads. For example, weather checking can be difficult when a tire is under-inflated. The inspector will need to stress the sidewalls by hand or with an inspection spreader.

Knowledge and ability to implement organization procedures, quality requirements at each inspection stage, and relevant regulatory requirements, within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to tyre inspection methods. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge and skills in tyre inspection and retreading process sufficient for consistent identification of good quality tyres for retreading:

- characteristics of finished and second hand tyres in relation to the impact of the retread process on product quality and safety
- importance of tyre size, speed rating and aspect ration markings of tyres on inspection decisions
- function and operating principles of inspection equipment
- impact of significantly faulty tyres falsely passing inspection
- correct selection and use of equipment, materials, processes and procedures.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- maintain inspection output and product quality using appropriate instruments, controls, test information and readings
- identify and describe own role and role of others involved directly in the retreading process.
- identify factors which may affect product quality or production output and appropriate remedies
- identify when assistance is required to solve problems.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, eg to determine how many 2 kg, 3 kg and 5 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

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.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- identify critical tyre properties and tyre inspection criteria in relation to the retreading process and the end product
- make adjustments to the inspection process as required
- identify and take appropriate action on inspection problems and potential problems.

Consistent performance should be demonstrated. For example, look to see that:

- inspection is done thoroughly and consistently
- all safety procedures are always followed.

Assessment method and context

Assessment will occur using industrial tyre inspection methods and equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using an appropriate tyre inspection method and/ or machine
- in a situation allowing for the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. Add any 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.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

The competency applies to the initial inspection of tyres for retreading. It covers the operation of inspection equipment and all relevant additional equipment where that equipment is integral to the tyre inspection process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- inspection equipment (such as NDI scanning equipment, nail hole detector, high pressure tester, x-ray or ultrasound)
- manual handling aids such as handcarts and overhead tracks
- hand held lights
- basic hand tools required for inspecting holes in the tyre casing
- relevant personal protective equipment.

Hazards

Typical hazards include:

- dust
- manual handling hazards
- noise.

Problems

'Anticipate and solve problems' means resolve a wide range of routine and non-routine problems, using product and process knowledge to develop solutions to problems which do not have a know solution/s recorded in the procedures.

Typical process and product problems may include:

- equipment malfunction
- detecting hidden damage
- blow-outs
- punctures
- broken chords
- cord body fabric damage
- wear patterns.

Appropriate action for problems outside area of responsibility may be reporting to an appropriate person.

Appropriate action for solving problems within area of responsibility includes asking questions and seeking assistance from appropriate persons/sources.

Variables

Key variables to be monitored include:

- tire size
- speed ratings
- aspect ration markings
- pressure
- discolouration.
-

Unit Sector(s)

Not applicable.

PMBPROD325B Lay on tyre retreads

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the laying of retread on casings prepared from used tyres and the solving of routine problems. It applies to the rubber sector of the industry.

Application of the Unit

Application of this unit

This competency is typically performed by advanced operators applying knowledge of materials, product purpose and processes to the operation of laying tyre retreads to produce product conforming to requirements. It also requires using a range of well developed skills requiring some discretion and judgement to recognise and resolve a range of problems.

The operator:

- start up tyre retread laying machinery
- check settings and adjustments of equipment
- monitor equipment and process operation
- make appropriate adjustments to correct materials, equipment or process variations
- solve retread laying equipment, material and process problems, seeking guidance where necessary or appropriate.

This unit does not include:

- inspection - see *PROD324 Inspect tyres for retreading*
- preparation - see *PROD266 Prepare tyre casings for retreading*.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

The required outcomes described in this unit contain applicable Employability Skills. The Employability Skills Summary of the qualification(s) in which this unit is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Plan own work requirements.	1.1 Identify the most appropriate equipment to be used for production and upstream and downstream operations from production plan or request. 1.2 Identify and check materials required. 1.3 Implement measures to control identified hazards in line with procedures and duty of care. 1.4 Identify requirements for materials, quality, production and equipment checks.
2. Start up retread laying process to procedures.	2.1 Identify process settings required for product. 2.2 Set process to required settings. 2.3 Check materials are correct. 2.4 Take appropriate action for non-conforming materials. 2.5 Set up date, batch and materials markings to

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
	specifications, as required. 2.6 Complete pre-start checks. 2.7 Start up retread laying process.
3. Operate and make adjustments to the retread laying process to procedures.	3.1 Operate retread laying process, noting key variables. 3.2 Monitor product/process quality. 3.3 Make adjustments to remedy faults and non-conformity as required. 3.4 Establish a stable retread laying process. 3.5 Adjust process to minimise scrap and trim. 3.6 Clean, adjust and lubricate equipment as required.
4. Shut down equipment to procedures.	4.1 Determine type of shut down. 4.2 Leave machine in appropriate condition and with appropriate locks, tags or notices. 4.3 Complete relevant documentation. 4.4 Ensure area is clean and clear after the shutdown, in readiness for the next start-up.
5. Anticipate and solve problems.	5.1 Recognise a problem or a potential problem 5.2 Determine problems needing priority action. 5.3 Refer problems outside area of responsibility to appropriate person, with possible causes. 5.4 Seek information and assistance as required to solve problems. 5.5 Solve problems within area of responsibility. 5.6 Follow through items initiated until final resolution has occurred.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and process sufficient to recognise material and equipment conditions which may lead to out of specification production. For example, the inspection and preparation of casings is crucial to the quality of a retreaded tyre. Therefore, it is important to check, once the casings have been prepared that there are no further problems with the casings prior to laying the retread.

Knowledge of organization procedures, quality requirements at each production stage and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the retread laying process. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Competence includes the ability for the practical completion of the job to apply and explain:

- characteristics of materials and behaviour in relation to heat, pressure, flow rate and time
- function and operating principles of retread laying processes, equipment, machine components and ancillary equipment
- impact of tyre size, faulty tyres, speed rating, finished and second hand tyres, and aspect ratio markings of tyres on product quality and production output
- phases of the retread laying cycle and the effect of the key variables on product quality, in order to make appropriate adjustments to process and equipment settings. For example, the adhesive laying phase is needed when laying pre-cured treads to the casings to bond tread during vulcanisation.
- processing behaviour of those polymers which are used in the workplace
- changes to materials at various stages of production
- waste management and importance of non-conforming materials
- impact of variations in raw materials and equipment operation in relation to final product.

Skill to identify the range of possible causes of product faults.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- maintain output and product quality using appropriate instruments, controls, test information and readings
- identify and describe own role and role of others involved directly in the retread laying process
- identify factors which may affect product quality or production output and appropriate remedies
- identify when the when assistance is required to solve problems.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, eg to determine how many 2 kg, 3 kg and 5 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

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.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- identify critical materials properties and retread laying process variables in relation to the process requirements and the end product
- make adjustments to the process as required
- identify and take appropriate action on problems and potential problems.

Consistent performance should be demonstrated. For example, look to see that:

- the process runs consistently and smoothly, with the minimum need for human intervention
- all safety procedures are always followed.

Assessment method and context

Assessment will occur on an industrial retread laying machine(s) and equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by use of appropriate, industrial retread laying equipment and machinery requiring demonstration of start up, operation and shut down procedures
- in a situation allowing the generation of evidence of the ability to recognise, anticipate and resolve problems
- by use of a suitable simulation and/or a range of case studies/scenarios
- by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. Add any 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.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency applies to tyre retreading. It includes the operation of all relevant additional equipment where that equipment is integral to the tread lay-up process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This unit of competency includes use of equipment and tools such as:

- manual handling aids (eg hand carts and trolleys)
- powered equipment/aids (eg compression rollers, staplers, cutting instruments and stone grinders)
- tread application equipment (eg semiautomatic builders to applying cured or uncured tread)
- moulds (for mould cure process)
- ancillary equipment (eg guide lights)
- hand tools (eg for roughing the surface, cutting and stapling the tread)
- raw materials (eg moulded tread and cushion gum)
- relevant personal protective equipment.

Hazards

Typical hazards include:

- fumes/vapours
- cutting tools
- manual handling hazards
- noise
- moving components of machinery and equipment.

Problems

'Anticipate and solve problems' means resolve a wide range of routine and non-routine problems, using product and process knowledge to develop solutions to problems which do not have a known solution/a solution recorded in the procedures.

Typical routine faults include:

- incorrect tread selected
- incorrect tyre inflation pressure.

Non-routine faults, which may have multiple causes include:

- faulty casings
- contamination of materials.

Typical process and product problems may include:

- equipment malfunction
- poorly aligned tread
- tread too long/short
- wrong tread profile.

Appropriate action for problems outside of area of responsibility may be reporting to an appropriate person.

Appropriate action for solving problems within area of responsibility includes asking questions and seeking assistance from appropriate persons/sources.

Variables

Key variables to be monitored include:

- speed (including equipment speed, laying of cured and uncured tread)
- pressure
- colour
- tyre components
- tread alignment
- product integrity and general conformance to specification and quality sample.
-

Unit Sector(s)

Not applicable.

PMBPROD326B Inspect tyres

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the testing and inspection of tyres and the solving of routine and non-routine problems.

Application of the Unit

Application of this unit

This competency is typically performed by advanced operators applying knowledge of materials, product purpose and processes in tyre inspection and testing to ensure quality, in both performance and safety, of finished tyres. It also requires using a range of well developed skills requiring some discretion and judgement to recognise and resolve a range of problems.

The operator will:

- inspect tyres visually, manually and by use of inspection equipment
- check settings and adjustments of equipment
- monitor equipment operation and correct variations
- identify non-conforming products and take appropriate action (eg ensuring discarded products are repaired where possible and/or scraped tyres are disposed of in accordance with workplace instructions)
- solve inspection and equipment problems, seeking guidance where necessary or appropriate.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

The required outcomes described in this unit contain applicable Employability Skills. The Employability Skills Summary of the qualification(s) in which this unit is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Plan own work requirements.	1.1 Identify the most appropriate equipment and processes to be used for tyre inspection and testing. 1.2 Identify different tyre types, identification codings and quality standards required. 1.3 Implement measures to control identified hazards in line with procedures and duty of care. 1.4 Identify repair, scrap tyre and housekeeping needs
2. Start up testing process to procedures.	2.1 Conduct visual inspection of tyres to spot obvious defects. 2.2 Manually locate bumps or dips. 2.3 Check inspection equipment settings and make adjustments as required. 2.4 Complete other pre-start checks in accordance with procedures.
3. Operate tyre testing	3.1 Operate machine to rotate and test tyres, following

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
machines to procedures.	standard operating procedures and State OHS requirements. 3.2 Monitor product quality in accordance with procedures. 3.3 Clean, adjust and lubricate equipment as required. 3.4 Shut down equipment to procedures, in normal or emergency situations. 3.5 Complete relevant documentation.
4. Respond to faults.	4.1 Identify possible routine and non-routine faults in the tyre. 4.2 Determine tyres needing action. 4.3 Determine possible fault causes. 4.4 Report faults outside area of responsibility to designated person. 4.5 Maintain appropriate records and log books to meet procedures/work instructions.
5. Stamp, label and sort tyres.	5.1 Stamp identification number on each tyre. 5.2 Label tyres with weekly code. 5.3 Sort passed tyres by coding. 5.4 Sort tyres for repair or scrap.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.

Application of knowledge of the materials, equipment and testing process sufficient to recognise material and equipment conditions which may lead to out of specification production.

Knowledge and ability to implement organization procedures, the quality requirements at each production stage and relevant regulatory requirements, within appropriate time constraints and work standards.

Application of the knowledge of managing risks using the hierarchy of controls applied to the tyre inspection/testing processes. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials. equipment operation and cleanup.

Knowledge and skills in tyre inspection and testing equipment, including:

- different tyre types and their construction and material content
- quality requirements for the different types of tyres
- function and operating principles of tyre testing equipment, machine components and ancillary equipment
- correct selection and use of equipment and inspection/testing procedures
- waste management and importance of repairing non-conforming products.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- maintain output and product quality using appropriate instruments, controls, test information and readings
- identify and describe own role and role of others involved directly in the inspection/testing process
- identify what faults the operator is able to recognise manually and when assistance by equipment is required.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets and machine control panels such as those displaying SPC information.

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, eg to determine how many 2 kg, 3 kg and 5 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

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.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- identify critical tyre properties and inspection criteria in relation to the end product
- make adjustments to inspections/testing process and equipment as required
- identify and take appropriate action on problems and potential problems.

Consistent performance should be demonstrated. For example, look to see that:

- tyre inspection and testing standards are met consistently
- all safety procedures are always followed.

Assessment method and context

Assessment will occur on an industrial tyre inspection/testing equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by observation over a range of tyre inspection/testing procedures undertaken in the workplace
- in a situation allowing for the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. Add any 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.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency applies to the inspection and testing of tyres within the rubber industry. It includes the operation of all relevant additional equipment where that equipment is integral to the inspection/testing process.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- tyre testing machines such as x-ray, uniformity, bulge test, and tyre balance test machines
- hand tools used in the inspection/testing process
- material loading equipment used for loading of tyres
- relevant personal protective equipment.

Hazards

Typical hazards include:

- manual handling hazards
- equipment operations
- dust/ vapours.

Problems

'Anticipate and solve problems' means resolve a wide range of routine and non-routine problems, using product and process knowledge to develop solutions to problems which do not have a known solution/s recorded in the procedures.

Typical routine faults include:

- bulges in sidewalls
- deformation
- damaged carcass
- offset
- snaking
- cuts.

Typical inspection/testing problems may include:

- equipment malfunction
- incorrect set-up of testing machine to tyre type
- detecting hidden damage.

Appropriate action for problems outside area of responsibility may be reporting to an appropriate person.

Appropriate action for solving problems within area of responsibility includes asking questions and seeking assistance from appropriate persons/sources.

Variables

Key variables to be monitored include:

- colour
- product weight
- product integrity and general conformance to specification/sample.
-

Unit Sector(s)

Not applicable.

PSPMNGT610A Manage public sector financial resources

Modification History

Release	TP Version	Comments
3	PSP12V1	Unit descriptor edited.
2	PSP04V4.2.	Layout adjusted. No changes to content.
1	PSP04V4.1	Primary release.

Unit Descriptor

This unit covers input into public sector budgeting, financial forecasting and reporting requirements, and the allocation and management of resources to achieve the required outputs of the business unit. It includes contributing to financial bids and estimates, allocating funds, managing budgets and reporting on financial activity.

In practice, the management of public sector financial resources may occur in the context of other generalist or specialist public sector workplace activities such as managing compliance with legislation, maintaining and enhancing ethical practice, managing people, policy etc.

This unit is one of 6 units of competency in the *Working in Government and Management* Competency fields that deal with resources.

Related units are:

- PSPGOV204B Access and use resources
- PSPGOV305B Access and use resources and financial systems
- PSPGOV403B Use resources to achieve work unit goals
- PSPGOV503B Coordinate resource allocation and usage

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

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements are the essential outcomes of the unit of competency. Together, performance criteria specify the requirements for competent performance. Text in *bold italics* is explained in the Range Statement following.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1. Contribute to financial bids and estimates

- 1.1 Organisational initiatives requiring the preparation of *bids* and *estimates* are identified in accordance with resource constraints and organisational needs.
- 1.2 *Information* for bids/estimates is substantiated, contains logical assumptions and takes account of strategic plans, government policies and priorities.
- 1.3 Information for bids/estimates is prepared in accordance with government *budgetary requirements* including a timeframe to meet critical submission dates.
- 1.4 *Documentation* to support bids/estimates is prepared in accordance with budget guidelines.

2. Allocate funds

- 2.1 *Budgets* are approved and financial resources are allocated according to organisational priorities/business plan.
- 2.2 Allocations are made in accordance with organisational policy and procedures and take account of any statutory requirements or constraints.
- 2.3 Audit trails are maintained to ensure accurate tracking and to identify variances between agreed and actual allocations.
- 2.4 Financial allocation is monitored against organisational objectives and priorities and *corrective action* is taken as

ELEMENT	PERFORMANCE CRITERIA
3. Manage budgets	<p>required in accordance with organisational policy and procedures.</p> <p>3.1 Budget management is undertaken that meets the financial accountability requirements of the organisation.</p> <p>3.2 Expenses are monitored against budget and authorised in accordance with financial <i>delegation</i> and organisational <i>financial controls</i>.</p> <p>3.3 <i>Financial reports</i> are obtained and provided in accordance with organisational requirements.</p> <p>3.4 Expenses are monitored through analysis of financial information/reports and problems are resolved or referred in accordance with organisational procedures and financial delegation.</p> <p>3.5 Expenditure is aligned with service delivery milestones/expectations.</p> <p>3.6 Changes to the budget are negotiated to account for potential under-spending, delays in service/program delivery, overruns and unneeded line items in accordance with organisational policy and procedures.</p>
4. Report on financial activities	<p>4.1 Requirements for financial management and reporting are identified in accordance with the public sector <i>financial management framework</i>.</p> <p>4.2 Financial management and reporting are undertaken in accordance with organisational requirements and <i>public sector financial management policy and procedures</i>.</p>

Required Skills and Knowledge

This section describes the essential skills and knowledge and their level, required for this unit.

Skill requirements

Look for evidence that confirms skills in:

- preparing information and reports requiring precision of expression
- meeting formatting and process requirements for bids and estimates and linkages to strategic plans
- monitoring financial information
- interpreting and signing off on financial reports
- interpreting organisational information in financial terms
- adjusting communication to suit different audiences

- using cross-cultural communication relating to financial management - across professional cultures such as accounting, IT, arts, policy areas
- responding to diversity, including gender and disability
- accessing information and legislation electronically or in hard copy
- applying environmental, sustainability and occupational health and safety procedures relating to working in the public sector

Knowledge requirements

Look for evidence that confirms knowledge and understanding of:

- financial management principles
- legislation, policies and processes relating to public sector financial management, such as conflicts of interest, procurement, value for money
- the organisation's financial accountability mechanisms
- corporate governance requirements
- internal controls and why they are used
- delegations and why the public sector uses them
- public sector financial management framework (detailed knowledge) and the relationship between the elements of the framework
- documents that make up the financial management framework
- legislation related to working in the public sector such as equal employment opportunity, environmental, sustainability and occupational health and safety requirements

Evidence Guide

The Evidence Guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the Unit descriptor, Performance Criteria, the Range Statement and the Assessment Guidelines for the Public Sector Training Package.

Units to be assessed together

- *Pre-requisite* units that must be achieved prior to this unit: *Nil*
- *Co-requisite* units that must be assessed with this unit: *Nil*
- *Co-assessed units* that may be assessed with this unit to increase the efficiency and realism of the assessment process include, but are not limited to:
 - PSPETHC601B Maintain and enhance confidence in public service
 - PSPLEGN601B Manage compliance with legislation in the public sector
 - PSPMNGT603B Facilitate people management
 - PSPMNGT602B Manage resources

- PSPMNGT608B Manage risk
- PSPMNGT609B Formulate business strategies
- PSPPOL603A Manage policy implementation

Overview of evidence requirements

In addition to integrated demonstration of the elements and their related performance criteria, look for evidence that confirms:

- the knowledge requirements of this unit
- the skill requirements of this unit
- application of the Employability Skills as they relate to this unit (see Employability Summaries in Qualifications Framework)
- management of public sector financial resources in a range of (2 or more) contexts (or occasions, over time)

Resources required to carry out assessment

These resources include:

- public sector and organisational financial procedures and protocols
- workplace scenarios and case studies to capture the range of situations likely to be encountered when managing public sector financial resources
- financial legislation and guidelines such as central agency guidelines
- budget process and guidelines

Where and how to assess evidence

Valid assessment of this unit requires:

- a workplace environment or one that closely resembles normal work practice and replicates the range of conditions likely to be encountered when managing public sector financial resources, including coping with difficulties, irregularities and breakdowns in routine
- management of public sector financial resources in a range of (2 or more) contexts (or occasions, over time)

Assessment methods should reflect workplace demands, such as literacy, and the needs of particular groups, such as:

- people with disabilities
- people from culturally and linguistically diverse backgrounds
- Aboriginal and Torres Strait Islander people
- women
- young people
- older people
- people in rural and remote locations

Assessment methods suitable for valid and reliable assessment of

this competency may include, but are not limited to, a combination of 2 or more of:

- case studies
- portfolios
- projects
- questioning
- scenarios
- authenticated evidence from the workplace and/or training courses

For consistency of assessment

Evidence must be gathered over time in a range of contexts to ensure the person can achieve the unit outcome and apply the competency in different situations or environments

Range Statement

The Range Statement provides information about the context in which the unit of competency is carried out. The variables cater for differences between States and Territories and the Commonwealth, and between organisations and workplaces. They allow for different work requirements, work practices and knowledge. The Range Statement also provides a focus for assessment. It relates to the unit as a whole. Text in ***bold italics*** in the Performance Criteria is explained here.

Bids may include:

- program discretionary bids
- program, sub-program, section, business unit bids
- portfolio managed bids

Estimates may include:

- budget estimates
- additional estimates
- forward estimates
- long-term estimates
- forecasts

Information may include:

- historical information
- cost-benefit analysis
- staff requirements
- contractual information
- efficiency/sustainability requirements

Budgetary requirements may include:

- zero-based budgeting
- accrual budgeting
- activity-based costing/management
- output-based budgeting

Supporting documentation may include:

- top-down/bottom-up approach
- base plus increment
- phasing for liability and expenditure/cash flow implications
- impact statements
- reasons for major variations to financial guidance
- staffing resources

Budgets may include:

- capital expenses
- recurrent expenses
- staffing costs
- cash flow
- forward estimates

Corrective action may include:

- re-prioritising activities
- funds transfer
- re-phasing liability/expenditure

Delegations are:

- functions or powers (under an act) assigned to others
- limited to specified powers or amounts
- made to persons in specified positions

Financial controls should:

- identify, record and measure revenue, expenses, assets, liabilities and equity
- ensure assets are safeguarded and used to avoid waste, extravagance, loss and misuse
- ensure liabilities are not incurred without proper authority
- ensure correct valuation, cut-off, presentation and disclosure of financial balances and transactions
- be linked to the organisation's risk management strategy

Financial reports may include:

- program, sub-program, section, business unit financial reports
- accrual reports
- monthly/quarterly financial reports including cost/unit, costs incurred compared with share of program delivered
- annual reports

Elements of the public sector financial management framework may include:

- internal controls
- segregation of duties
- delegations
- corporate governance requirements
- service level agreements
- internal and external reporting
- risk management

Public sector financial

- financial management acts and regulations

policies and procedures
may include:

- financial administration and audit acts
- Treasury guidelines
- public sector finance standards
- financial management benchmarking studies
- the organisation's:
 - financial management practice manual
 - delegation manual
 - budget manual/instructions
 - style manual
 - quality manual
- government financial policy statements

Unit Sector(s)

Not applicable.

Competency field

Management.

TAEASS401B Plan assessment activities and processes

Modification History

Version	Comments
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TAEASS301B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>
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Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to plan and organise the assessment process, including recognition of prior learning (RPL), in a competency-based assessment system. It also includes the development of simple assessment instruments.

Application of the Unit

This unit typically applies to assessors and workplace supervisors with assessment planning responsibilities; and trainers or other assessors responsible for planning assessment, including RPL.

The unit is suitable for those with an existing assessment strategy which documents the overall framework for assessment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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Elements describe the essential outcomes of a

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text

ELEMENT

unit of competency.

PERFORMANCE CRITERIA

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

1. Determine assessment approach	<p>1.1 Identify candidate and confirm <i>purposes and context of assessment/RPL</i> with relevant people according to <i>legal, organisational and ethical requirements</i></p> <p>1.2 Identify and access <i>benchmarks for assessment/RPL</i> and any specific assessment guidelines</p>
2. Prepare the assessment plan	<p>2.1 Determine evidence and <i>types of evidence</i> needed to demonstrate competence, according to the <i>rules of evidence</i></p> <p>2.2 Select <i>assessment methods</i> which will support the collection of defined evidence, taking into account the context in which the assessment will take place</p> <p>2.3 Document all aspects of the <i>assessment plan</i> and confirm with relevant personnel</p>
3. Develop assessment instruments	<p>3.1 Develop <i>simple assessment instruments</i> to meet target group needs</p> <p>3.2 Analyse <i>available assessment instruments</i> for their suitability for use and modify as required</p> <p>3.3 <i>Map assessment</i> instruments against unit or course requirements</p> <p>3.4 Write clear instructions for candidate about the use of the instruments</p> <p>3.5 Trial draft assessment instruments to validate content and applicability, and record outcomes</p>

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- cognitive interpretation skills to:
 - interpret competency standards and other assessment documentation, including material

- relating to reasonable adjustment
- identify opportunities for integrated competency assessment
- contextualise competency standards to the operating assessment environment, including RPL
- consider access and equity needs of diverse candidates
- technology skills to use appropriate equipment and software to communicate effectively with others
- research and evaluation skills to:
 - obtain competency standards, assessment tools and other relevant assessment resources
 - research candidate characteristics and any reasonable adjustment needs
 - evaluate feedback, and determine and implement improvements to processes
- literacy skills to read and interpret relevant information to design and facilitate assessment and recognition processes
- communication skills to discuss assessment, including RPL processes with clients and other assessors
- interpersonal skills to:
 - demonstrate sensitivity to access and equity considerations and candidate diversity
 - promote and implement equity, fairness, validity, reliability and flexibility in planning an assessment processes.
- **Required knowledge**
- ethical and legal requirements of an assessor
- competency-based assessment, including:
 - work focused
 - criterion referenced
 - standards based
 - evidence based
- different purposes of assessment and different assessment contexts, including RPL
- how to read and interpret the identified competency standards as the benchmarks for assessment
- how to contextualise competency standards within relevant guidelines
- four principles of assessment and how they guide the assessment process
- purpose and features of evidence, and different types of evidence used in competency-based assessments, including RPL
- rules of evidence and how they guide evidence collection
- different types of assessment methods, including suitability for collecting various types of evidence
- assessment instruments and their purpose; different types of instruments; relevance of different instruments for specific evidence-gathering opportunities.

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	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<ul style="list-style-type: none"> • Evidence of the ability to: • plan and organise the assessment process on a minimum of two occasions • collect evidence that demonstrates: <ul style="list-style-type: none"> • documented assessment plans • having covered a range of assessment events • catering for a number of candidates • different competency standards or accredited curricula • an RPL assessment • contextualisation of competency standards and the selected assessment tools, where required • incorporation of reasonable adjustment strategies • development of simple assessment instruments for use in the process • organisational arrangements.
Context of and specific resources for assessment	<p>Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.</p> <p>Assessment must ensure access to training products, such as training packages and accredited course documentation.</p>
Method of assessment	
Guidance information for assessment	

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.

<p><i>Purposes of assessment/ RPL</i> may include:</p>	<ul style="list-style-type: none"> • recognising current existing competence of candidates • determining if competence has been achieved following learning • establishing candidate progress towards achievement of competence • determining language, literacy and numeracy needs of candidates • certifying competence through a qualification or Statement of Attainment • licensing or regulatory requirements.
<p><i>Context of assessment/ RPL</i> may include:</p>	<ul style="list-style-type: none"> • environment in which the assessment/RPL will be carried out, including real or simulated workplace • opportunities for collecting evidence in a number of situations • relationships between competency standards and: <ul style="list-style-type: none"> • evidence to support RPL • work activities in the candidate's workplace • learning activities • who carries out the assessment/RPL.
<p><i>Organisational, legal and ethical requirements</i> may include:</p>	<ul style="list-style-type: none"> • assessment system policies and procedures • assessment strategy requirements • reporting, recording and retrieval systems for assessment, including RPL • quality assurance systems • business and performance plans • access and equity policies and procedures • collaborative and partnership arrangements • defined resource parameters • mutual recognition arrangements • industrial relations systems and processes, awards, and enterprise agreements • Australian Quality Training Framework • registration scope • human resources policies and procedures • legal requirements, including: <ul style="list-style-type: none"> • anti-discrimination • equal employment opportunity • job role, responsibilities and conditions • relevant industry codes of practice • confidentiality and privacy requirements • OHS considerations, including: <ul style="list-style-type: none"> • ensuring OHS requirements are adhered to during the

	<p>assessment process</p> <ul style="list-style-type: none"> identifying and reporting OHS hazards and concerns to relevant personnel.
Benchmarks for assessment/RPL may include:	<ul style="list-style-type: none"> criterion against which the candidate is assessed or prior learning recognised, which may be: <ul style="list-style-type: none"> competency standard/unit of competency assessment criteria of course curricula performance specifications of an enterprise or industry product specifications.
Types of evidence may include:	<ul style="list-style-type: none"> direct indirect supplementary.
Rules of evidence ensure that evidence collected is:	<ul style="list-style-type: none"> valid sufficient authentic current.
Assessment methods are the particular techniques used to gather evidence and may include:	<ul style="list-style-type: none"> direct observation, for example: <ul style="list-style-type: none"> real work/real time activities at the workplace work activities in a simulated workplace environment structured activities, for example: <ul style="list-style-type: none"> simulation exercises and role-plays projects presentations activity sheets questioning, for example: <ul style="list-style-type: none"> written questions, e.g. on a computer interviews self-assessment verbal questioning questionnaires oral or written examinations (applicable at higher AQF levels) portfolios of evidence, for example: <ul style="list-style-type: none"> collection of work samples compiled by candidate product with supporting documentation historical evidence journal or log book information about life experience review of products, for example: <ul style="list-style-type: none"> testimonials and reports from employers and supervisors

	<ul style="list-style-type: none"> evidence of training authenticated prior achievements interview with employer, supervisor, or peer.
<i>Assessment plan</i> may include:	<ul style="list-style-type: none"> overall planning document describing: <ul style="list-style-type: none"> what is to be assessed when assessment is to take place where assessment is to take place how assessment is to take place.
<i>Simple assessment instruments</i> may include:	<ul style="list-style-type: none"> instruments developed by an assessor as part of formative or summative assessment activities, including: <ul style="list-style-type: none"> profiles of acceptable performance measures templates and proformas specific questions or activities evidence and observation checklists checklists for the evaluation of work samples recognition portfolios candidate self-assessment materials instruments developed elsewhere that have been modified by the assessor for use with a particular client group.
<i>Available assessment instruments</i> may include:	<ul style="list-style-type: none"> commercially available instruments those created by others inside the registered training organisation.
<i>Map assessment</i> means:	<ul style="list-style-type: none"> showing a clear relationship between the evidence and the requirements of the unit.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS402B Assess competence

Modification History

Version	Comments
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TAEASS402B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>
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Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to assess the competence of a candidate.

Application of the Unit

This unit typically applies to assessors.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

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

1. Prepare for assessment	<p>1.1 Interpret <i>assessment plan</i> and confirm organisational, legal and ethical requirements for conducting assessment with relevant people</p> <p>1.2 Access and interpret relevant <i>benchmarks for assessment</i> and nominated <i>assessment tools</i> to confirm the requirements for evidence to be collected</p> <p>1.3 Arrange identified material and physical resource requirements according to assessment system policies and procedures</p> <p>1.4 Organise <i>specialist support</i> required for assessment</p> <p>1.5 Explain, discuss and agree details of the assessment plan with candidate</p>
2. Gather quality evidence	<p>2.1 Use agreed <i>assessment methods</i> and instruments to gather, organise and document evidence in a format suitable for determining competence</p> <p>2.2 Apply the principles of assessment and rules of evidence in gathering quality evidence</p> <p>2.3 Determine opportunities for evidence gathering in actual or simulated activities through consultation with the candidate and relevant personnel</p> <p>2.4 Determine opportunities for integrated assessment activities and document any changes to assessment instruments where required</p>
3. Support the candidate	<p>3.1 Guide candidates in gathering their own evidence to support recognition of prior learning (RPL)</p> <p>3.2 Use appropriate communication and interpersonal skills to develop a professional relationship with the candidate that reflects sensitivity to <i>individual differences</i> and enables two-way <i>feedback</i></p> <p>3.3 Make decisions on reasonable adjustments with the candidate, based on candidate's needs and characteristics</p> <p>3.4 Access required specialist support in accordance with the assessment plan</p> <p>3.5 Address any OHS risk to person or equipment immediately</p>
4. Make the assessment decision	<p>4.1 Examine collected evidence and evaluate it to ensure that it reflects the evidence required to demonstrate competence</p> <p>4.2 Use judgement to infer whether competence has been demonstrated, based on the available evidence</p> <p>4.3 Make assessment decision in line with agreed assessment procedures and according to agreed assessment plan</p> <p>4.4 Provide clear and constructive feedback to candidate regarding</p>

	the assessment decision and develop any follow-up action plan required
5. Record and report the assessment decision	5.1 Record assessment outcomes promptly and accurately 5.2 Complete and process an assessment report according to agreed assessment procedures 5.3 Inform other relevant parties of the assessment decision according to confidentiality conventions
6. Review the assessment process	6.1 Review the assessment process in <i>consultation</i> with relevant people to improve own future practice 6.2 Document and record the review according to relevant assessment system policies and procedures

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analysis and interpretation skills to:
 - break down competency standards
 - interpret assessment tools and other assessment information, including those used in RPL
 - identify candidate needs
 - make judgements based on assessment of available evidence
- observation skills to:
 - recognise candidate's prior learning
 - determine candidate's performance
 - identify when candidate may need assistance during the assessment processes
- research and evaluation skills to:
 - access required human and material resources for assessment
 - access assessment system policies and procedures
 - access RPL policies and procedures
 - evaluate evidence
 - evaluate assessment process
- cognitive skills to:
 - weigh up the evidence and make a judgement
 - consider and recommend reasonable adjustments
- decision-making skills to:
 - recognise a candidate's prior learning

- make a decision on a candidate's competence
- literacy skills to:
 - read and interpret relevant information to conduct assessment
 - prepare required documentation and records or reports of assessment outcomes in required format
- communication and interpersonal skills to:
 - explain the assessment, including RPL process
 - give clear and precise instructions
 - ask effective questions
 - provide clarification
 - discuss process with other relevant people
 - give appropriate feedback
 - discuss assessment outcome
 - use language appropriate to candidate and assessment environment
 - establish a working relationship with candidate.

Required knowledge

- competency-based assessment, including:
 - vocational education and training as a competency-based system
 - criterion-referenced assessment as distinct from norm-referenced assessment
 - competency standards as the basis of qualifications
 - structure and application of competency standards
 - principles of assessment and how they are applied
 - rules of evidence and how they are applied
 - range of assessment purposes and assessment contexts, including RPL
 - different assessment methods, including suitability for gathering various types of evidence, suitability for content of units, and resource requirements and associated costs
 - reasonable adjustments and when they are applicable
 - types and forms of evidence, including assessment instruments that are relevant to gathering different types of evidence used in competency-based assessment, including RPL
 - potential barriers and processes relating to assessment tools and methods
 - assessment system, including policies and procedures established by the industry, organisation or training authority
- RPL policies and procedures established by the organisation
- cultural sensitivity and equity considerations
- relevant policy, legislation, codes of practice and national standards, including commonwealth and state or territory legislation that may affect training and assessment in the vocational education and training sector, such as:
 - copyright and privacy laws in terms of electronic technology
 - security of information

- plagiarism
- training packages and competency standards
- licensing requirements
- industry and workplace requirements
- duty of care under common law
- recording information and confidentiality requirements
- anti-discrimination, including equal employment opportunity, racial vilification and disability discrimination
- workplace relations
- industrial awards and enterprise agreements
- OHS responsibilities associated with assessing competence, such as:
 - requirements for reporting hazards and incidents
 - emergency procedures
 - procedures for use of relevant personal protective equipment
 - safe use and maintenance of relevant equipment
 - sources of OHS information.
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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	
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> • assess competence of a number of candidates within the vocational education and training context against different units of competency or accredited curricula, following the relevant assessment plan • assess at least one candidate for RPL • consider reasonable adjustment and the reasons for decisions in at least one assessment • cover an entire unit of competency and show: <ul style="list-style-type: none"> • the application of different assessment methods and instruments involving a range of assessment activities and events • two-way communication and feedback • how judgement was exercised in making the assessment decision • how and when assessment outcomes were recorded and reported

	<ul style="list-style-type: none"> assessment records and reports completed in accordance with assessment system and organisational, legal and ethical requirements how the assessment process was reviewed.
Context of and specific resources for assessment	Evidence must be gathered in the workplace whenever possible. Where no workplace is available, a simulated workplace must be provided.
Method of assessment	
Guidance information for assessment	

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.

<i>Assessment plan</i> may include:	<ul style="list-style-type: none"> overall planning, describing: <ul style="list-style-type: none"> what is to be assessed when assessment is to take place where assessment is to take place how assessment is to take place.
<i>Benchmarks for assessment:</i>	<ul style="list-style-type: none"> refer to a criterion against which the candidate is assessed may be a competency standard/unit of competency, assessment criteria of course curricula, performance specifications, or product specifications.
<i>Assessment tools</i> include:	<ul style="list-style-type: none"> the learning or competency unit(s) to be assessed the target group, context and conditions for the assessment the tasks to be administered to the candidate an outline of the evidence to be gathered from the candidate the evidence criteria used to judge the quality of performance (i.e. the assessment decision-making rules) the administration, recording and reporting requirements the evidence of how validity and reliability have been tested and built into the design and use of the tool.

<p><i>Specialist support</i> may include:</p>	<ul style="list-style-type: none"> • assistance by third party, such as carer or interpreter • support from specialist educator • provision of developed online assessment activities • support for remote or isolated candidates and assessors • support from subject matter or safety experts • advice from regulatory authorities • assessment teams and panels • support from lead assessors • advice from policy development experts.
<p><i>Assessment methods</i> include:</p>	<ul style="list-style-type: none"> • particular techniques used to gather different types of evidence, such as: <ul style="list-style-type: none"> • direct observation • structured activities • oral or written questioning • portfolios of evidence • review of products • third-party feedback.
<p><i>Individual differences</i> may include:</p>	<ul style="list-style-type: none"> • English language, literacy and numeracy barriers • physical impairment or disability • intellectual impairment or disability • medical condition that may impact on assessment, such as arthritis, epilepsy, diabetes and asthma • learning difficulties • mental or psychological disability • religious and spiritual observances • cultural images and perceptions • age • gender.
<p><i>Feedback</i> may include:</p>	<ul style="list-style-type: none"> • ensuring assessment/RPL process is understood • ensuring candidate concerns are addressed • enabling questions and answers • confirming outcomes • identifying further evidence to be provided • discussing action plans • confirming gap training needed • providing information regarding available appeal processes • suggesting improvements in evidence gathering and

	presentation.
<i>Consultation</i> may involve:	<ul style="list-style-type: none">• moderation with other assessors, or training and assessment coordinators• discussions with client, team leaders, managers, RPL coordinators, supervisors, coaches and mentors• technical and subject experts• English language, literacy and numeracy experts.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS403B Participate in assessment validation

Modification History

Version	Comments
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TAEASS403B	Released with TAE10 Training and Education Training Package version 2.0
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Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to participate in an assessment validation process.

Application of the Unit

This unit typically applies to those participating in assessment validation. It does not address leading the validation process.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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<i>Elements describe the essential outcomes of a unit of competency.</i>	<i>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.</i>
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Elements and Performance Criteria

1. Prepare for validation	<p>1.1 Discuss and confirm the approach to validation according to defined purposes, context, and relevant <i>assessment system policies and procedures</i></p> <p>1.2 Analyse relevant <i>benchmarks for assessment</i> and agree on the evidence needed to demonstrate competence</p> <p>1.3 Arrange <i>materials</i> for <i>validation activities</i></p>
2. Contribute to validation process	<p>2.1 Demonstrate active <i>participation</i> in validation sessions and activities using appropriate communication skills</p> <p>2.2 Participate in validation sessions and activities by applying the principles of assessment and rules of evidence</p> <p>2.3 Check all documents used in the validation process for accuracy and version control</p>
3. Contribute to validation outcomes	<p>3.1 Collectively discuss validation findings to support improvements in the quality of assessment</p> <p>3.2 Discuss, agree and record recommendations to improve assessment practice</p> <p>3.3 Implement changes to own assessment practice, arising from validation</p>

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- planning skills to participate in validation activities within agreed timeframes
- problem-solving skills to identify information that is inconsistent, ambiguous or contradictory
- evaluation skills to:
 - determine evidence requirements from competency standards
 - review assessment process, tools and methods
 - review collected evidence
- communication skills to share information in validation meetings.

Required knowledge

- how to interpret competency standards and other related assessment information to determine the evidence needed to demonstrate competence, including:
 - criterion-referenced assessment as distinct from norm-referenced assessment

- various reasons for carrying out validation and the different approaches to validation that may be appropriate before, during and after assessment
- critical aspects of validation, including validation of assessment processes, methods and products
- relevant OHS legislation, codes of practice, standards and guidelines, impacting on assessment
- legal and ethical requirements of assessors, particularly in relation to validation activities
- principles of assessment
- rules of evidence.

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	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> • actively participate in a minimum of two validation sessions or meetings which, in combination, address the critical aspects of validation using different validation approaches and activities • clearly explain purposes of validation and the legal and ethical responsibilities of assessors • collate documentation relating to validation process in a logical manner • demonstrate communication and liaison with relevant people • provide feedback and interpret documentation in validation sessions • record contribution to validation findings.
Context of and specific resources for assessment	<p>Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.</p> <p>Assessment must ensure access to:</p> <ul style="list-style-type: none"> • assessment reports and records • other documentation relevant to validation.
Method of assessment	
Guidance information	

for assessment	
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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.

<i>Assessment system policies and procedures</i> may include:	<ul style="list-style-type: none"> • candidate selection • rationale and purpose of competency-based assessment • assessment records, and data and information management • recognition of current competency, recognition of prior learning and credit arrangements • assessment reporting procedures • assessment appeals • candidate grievances and complaints • validation • evaluation and internal audit • costs and resourcing • access and equity, and reasonable adjustment • partnership arrangements • links with human resource or industrial relations system • links with overall quality management system.
<i>Benchmarks for assessment:</i>	<ul style="list-style-type: none"> • refers to criterion against which the candidate is assessed • may be one or more units of competency or assessment criteria of course curricula.
<i>Materials</i> may include:	<ul style="list-style-type: none"> • assessment tools • samples of collected evidence • documentation outlining the basis of assessment decisions • reports and records of assessment decisions • samples of benchmarks of appropriate evidence • Assessment Guidelines of the relevant training packages • information from the evidence guide of the relevant units of competency.
<i>Validation activities</i> may include:	<ul style="list-style-type: none"> • analysing and reviewing: <ul style="list-style-type: none"> • assessment tools • collected evidence • assessment decisions and records of assessment outcomes

	<ul style="list-style-type: none">• other aspects of assessment policies, processes and outcomes• recording evidence of validation processes and outcomes.
<i>Participation</i> may include comparison and evaluation of:	<ul style="list-style-type: none">• assessment practices• assessment plans• interpretation of units of competency• assessment methods and instruments• assessment decisions• collected evidence.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS502B Design and develop assessment tools

Modification History

Version	Comments
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TAEASS502B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>
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Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to design and develop assessment tools, including tools used in formative, summative and recognition of prior learning (RPL) assessment.

Application of the Unit

An assessment tool is used to guide the collection of quality evidence in the assessment process. It includes the specific instruments for collecting evidence, as well as information about assessment methods and the procedures to be followed in conducting the assessment.

This unit typically applies to those involved in training and assessment or in the development of learning resources or products, assessors, learning resource or product developers, and training and assessment consultants.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
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Elements describe the essential outcomes of a

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text

ELEMENT

unit of competency.

PERFORMANCE CRITERIA

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

1. Determine focus of the assessment tool	<p>1.1 Identify target group of candidates, purposes of <i>assessment tool</i>, and <i>contexts</i> in which the tool will be used</p> <p>1.2 Access relevant <i>benchmarks for assessment</i> and interpret them to establish evidence required to demonstrate competence</p> <p>1.3 Identify, access and interpret <i>organisational, legal and ethical requirements</i> and relevant <i>contextualisation guidelines</i></p> <p>1.4 Identify other <i>related documentation</i> to inform assessment tool development</p>
2. Design assessment tool	<p>2.1 Select assessment methods that support the collection of defined evidence, taking into account the context in which the assessment will take place and meeting the principles of assessment</p> <p>2.2 Enable candidates to show or support their claim for recognition of current competency through selected assessment methods</p> <p>2.3 Consider different <i>assessment instruments</i> for the selected assessment methods to generate options for collection of evidence</p> <p>2.4 Consider how the assessment instruments will be administered</p>
3. Develop assessment tool	<p>3.1 Develop specific assessment instruments that address the evidence to be collected</p> <p>3.2 Define and document clear and specific <i>procedures</i> instructing assessor and candidate on the administration and use of the instruments</p> <p>3.3 Consider requirements of <i>assessment system policies and procedures</i> and address storage and retrieval needs, and review, evaluation and version control procedures as part of this process</p>
4. Review and trial assessment tool	<p>4.1 Check draft assessment tools against <i>evaluation criteria</i> and amend as required</p> <p>4.2 Trial assessment tools to validate content and applicability</p> <p>4.3 Collect and document feedback from relevant people involved in trialling</p> <p>4.4 Make amendments to final tool based on analysis of feedback</p>

	4.5 Appropriately format and file finalised assessment tool according to assessment system policies and procedures and organisational, legal and ethical requirements
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Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analysis and interpretation skills to review and evaluate assessment tools
- critical thinking skills to translate the interpreted competency standards and other relevant assessment information into meaningful assessment instruments
- design skills to develop different assessment tool designs
- research and evaluation skills to evaluate assessment tools on the basis of trials and feedback.

Required knowledge

- principles of assessment and how they are applied when developing assessment tools
- different types and rules of evidence
- different assessment contexts and relationship to developing assessment tools
- components of competency and dimensions of competency
- contextualisation of competency standards and contextualisation guidelines
- Assessment Guidelines of training packages as relevant to developing assessment tools
- different assessment methods, their purposes and uses
- evaluation methodologies appropriate to the trial and review of assessment tools
- principles of reasonable adjustment
- relevant workplace information, including:
 - organisational policies and procedures
 - workplace tasks and activities
 - standard operating procedures
 - procedures for use of relevant personal protective equipment.

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	
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<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> • develop assessment tools that support different assessment methods and address at least three units of competency packaged at different Australian Qualifications Framework (AQF) levels • develop assessment tools that: <ul style="list-style-type: none"> • include the instruments for collecting evidence, reflecting the principles of assessment and the rules of evidence, and the related instructions to assessor/s and candidates • show how the contextual needs of different environments are addressed • report on the trial and review of the assessment tools, including proposed changes.
<p>Context of and specific resources for assessment</p>	<p>Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.</p> <p>Assessment must ensure access to:</p> <ul style="list-style-type: none"> • training products, such as training packages and accredited course documentation.
<p>Method of assessment</p>	
<p>Guidance information for assessment</p>	

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.

<p>Assessment tool includes:</p>	<ul style="list-style-type: none"> • the learning or competency unit(s) to be assessed • the target group, context and conditions for the assessment • the tasks to be administered to the candidate • an outline of the evidence to be gathered from the candidate • the evidence criteria used to judge the quality of performance (i.e. the assessment decision-making rules) • the administration, recording and reporting requirements • the evidence of how validity and reliability have been tested and built into the design and use of the tool.
<p>Contexts of assessment/RPL may include:</p>	<ul style="list-style-type: none"> • environment in which the assessment/RPL will be carried out, including real or simulated workplace • opportunities for collecting evidence in a number of situations • relationships between competency standards and evidence to support RPL • who carries out the assessment/RPL • relationships between competency standards and work activities in the candidate's workplace • relationships between competency standards and learning activities.
<p>Benchmarks for assessment:</p>	<ul style="list-style-type: none"> • refer to criteria against which the candidate is assessed which may be a unit of competency, assessment criteria of course curricula, performance specifications, or product specifications • where the benchmark is one or more units of competency the standards may be contextualised to reflect the immediate operating environment.
<p>Organisational, legal and ethical requirements may include:</p>	<ul style="list-style-type: none"> • assessment system policies and procedures • industrial relations systems and processes, awards and enterprise agreements • licensing and legal ramifications of assessing competence • reporting, recording and retrieval systems for assessment • requirements of training, assessment and validation, including the AQTF Standards for Registered Training Organisations • human resource policies, procedures and legal requirements, including: <ul style="list-style-type: none"> • anti-discrimination • equal employment opportunity • job role, responsibilities and conditions • relevant industry codes of practice • confidentiality and privacy requirements of information relating to completed assessments

	<ul style="list-style-type: none"> • OHS considerations, including: <ul style="list-style-type: none"> • ensuring assessment methods and tools incorporate appropriate measures to maintain the health, safety and welfare of candidates • ensuring OHS requirements and specified benchmarks are accounted for within evidence requirements and assessment materials • identifying hazards and relevant risk control procedures associated with the assessment environment.
Contextualisation guidelines relate to:	<ul style="list-style-type: none"> • relevant training package or accredited course contextualisation guidelines.
Related documentation may include:	<ul style="list-style-type: none"> • requirements set out in the Assessment Guidelines of the relevant training packages • information from the competency standards about: <ul style="list-style-type: none"> • resources required for assessment • assessment context • appropriate assessment methods • assessment activities identified in accredited modules derived from the relevant competency standards • assessment activities in support materials related to the relevant competency standards • any requirements of OHS, legislation, codes of practice, standards and guidelines • indicators and levels of competence of the Australian Core Skills Framework • organisational requirements for demonstration of work performance • product specifications.
Assessment instrument may be:	<ul style="list-style-type: none"> • profiles of acceptable performance measures • templates and proformas • specific questions or activities • evidence and observation checklists • checklists for the evaluation of work samples • recognition portfolios • candidate self-assessment materials.

<i>Procedures</i> may include:	<ul style="list-style-type: none"> • those that guide the application of the instruments, such as: <ul style="list-style-type: none"> • instructions for the candidates • instructions for administering the assessment tool, including resources needed to conduct assessment and the context for the use of tools • guidance for development or review of decision-making process • guidance on reasonable adjustments • specified variations or restrictions on the tools • rules for verifying assessment decisions • OHS requirements, for example, identified hazards in the assessment environment and appropriate controls and reporting mechanisms • information on access and equity considerations.
<i>Assessment system policies and procedures</i> may include:	<ul style="list-style-type: none"> • assessment records, and data and information management • recognition of current competency, RPL and credit arrangements • assessor needs, qualifications and maintenance of currency • assessment reporting procedures • assessment appeals • candidate grievances and complaints • validation • evaluation and internal audit • costs and resourcing • access and equity, and reasonable adjustment • partnership arrangements • links with human resource or industrial relations systems • links with overall quality management system.
<i>Evaluation criteria</i> may include:	<ul style="list-style-type: none"> • effectiveness and relevance to the competency standards • whether assessment tool is appropriate to selected assessment methods • whether assessment tool is appropriate to target group and assessment context • appropriateness of language and literacy for intended audience.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEDEL301A Provide work skill instruction

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to conduct individual and group instruction and demonstrate work skills, using existing learning resources in a safe and comfortable learning environment. The unit covers the skills and knowledge required to determine the success of both the training provided and one's own personal training performance. It emphasises the training as being driven by the work process and context.
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Application of the Unit

Application of the unit	This unit supports a wide range of applications across any workplace setting and so can be used by any organisation. Its use is not restricted to training organisations.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Organise instruction and demonstration	1.1. Gather information about <i>learner characteristics</i> and learning needs 1.2. Confirm a <i>safe learning environment</i> 1.3. Gather and check <i>instruction and demonstration objectives</i> and seek assistance if required 1.4. Access and review relevant <i>learning resources</i> and <i>learning materials</i> 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 <i>details</i> 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 <i>OHS procedures</i> and requirements prior to and during training 2.4. Use <i>delivery techniques</i> to structure, pace and enhance learning 2.5. Apply <i>coaching</i> techniques to assist learning 2.6. Use communication skills to provide information,

ELEMENT	PERFORMANCE CRITERIA
	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 <i>measures</i> 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 learner 3.3. Review relationship between the trainer/coach and the learner and adjust to suit learner needs
4. Review personal training performance and finalise documentation	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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- verbal and non-verbal communication techniques, such as:
 - asking relevant and appropriate questions
 - providing explanations
 - demonstrating
 - using listening skills
 - providing information clearly
- safety skills to implement OHS requirements, by acting and responding safely in order to:
 - identify hazards
 - conduct prestart-up checks if required
 - observe and interpret learner behaviour that may put people at risk
- time-management, skills to:

REQUIRED SKILLS AND KNOWLEDGE

- ensure all learning objectives are covered
- pace learning
- reflection skills in order to:
 - identify areas for improvement
 - maintain personal skill development
- literacy skills to:
 - complete and maintain documentation
 - read and follow learning programs and plans
 - read and analyse learner information
- technology skills to operate audio-visual and technical equipment
- interpersonal skills to:
 - engage, motivate and connect with learners
 - provide constructive feedback
 - maintain appropriate relationships
 - establish trust
 - use appropriate body language
 - maintain humour
 - demonstrate tolerance
 - manage a group
 - recognise and be sensitive to individual difference and diversity
- observation skills to:
 - monitor learner acquisition of new skills, knowledge and competency requirements
 - assess learner communication and skills in interacting with others
 - identify learner concerns
 - recognise learner readiness to take on new skills and tasks

Required knowledge

- learner characteristics and needs
- content and requirements of the relevant learning program and/or delivery plan
- sources and availability of relevant learning resources and learning materials
- content of learning resources and learning materials
- training techniques that enhance learning and when to use them
- introductory knowledge of learning principles and learning styles
- key OHS 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

REQUIRED SKILLS AND KNOWLEDGE

procedures

- risk controls for the specific learning environment

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

Assessment must address the scope of this unit and reflect all components of the unit. A range of appropriate assessment methods and evidence-gathering techniques must be used to determine competency. A judgement of competency should only be made when the assessor is confident that the required outcomes of the unit have been achieved and that consistent performance has been demonstrated.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of the ability to:

- carry out a minimum of three training sessions, involving demonstrating and instructing particular work skills for different groups; with each session addressing:
 - different learning objectives
 - a range of techniques and effective communication skills appropriate to the audience.

Context of and specific resources for assessment

Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.

Method of assessment**Guidance information for assessment**

For further information about assessment of this and other TAE units, refer to relevant implementation guidance published on the IBSA website (www.ibsa.org.au).

Range Statement**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.

<i>Learner characteristics</i> may include:	<ul style="list-style-type: none"> • language, literacy and numeracy levels • learning styles • past learning and work experiences • specific needs • workplace culture.
<i>Safe learning environment</i> may include:	<ul style="list-style-type: none"> • exit requirements • personal protective equipment • safe access • safe use of equipment.
<i>Instruction and demonstration objectives</i> may include:	<ul style="list-style-type: none"> • competencies to be achieved • generic and technical skills, which may be: <ul style="list-style-type: none"> • provided by the organisation • developed by a colleague • individual or group objectives • learning outcomes.
<i>Learning resources</i> may include:	<ul style="list-style-type: none"> • any material used to support learning, such as: <ul style="list-style-type: none"> • learner and user guides • trainer and facilitator guides • example training programs • specific case studies • professional development materials • assessment materials • a variety of formats • those produced locally • those acquired from other sources.
<i>Learning materials</i> may include:	<ul style="list-style-type: none"> • handouts for learners • materials sourced from the workplace, e.g. workplace documentation, operating procedures, and specifications.
<i>Details</i> may include:	<ul style="list-style-type: none"> • location and time • outcomes of instruction or demonstration • reason for instruction or demonstration • who will be attending instruction session.

RANGE STATEMENT	
<i>OHS procedures</i> may include:	<ul style="list-style-type: none"> • emergency procedures • hazards and their means of control • incident reporting • use of personal protective equipment • safe work practices • safety briefings • site-specific safety rules.
<i>Delivery techniques</i> may include:	<ul style="list-style-type: none"> • coaching • demonstration • explanation • group or pair work • providing opportunities to practise skills and solve problems • questions and answers.
<i>Coaching</i> may include:	<ul style="list-style-type: none"> • learning arrangements requiring immediate interaction and feedback • on-the-job instruction and 'buddy' systems • relationships targeting enhanced performance • short-term learning arrangements • working on a one-to-one basis.
<i>Measures</i> may include:	<ul style="list-style-type: none"> • informal review or discussion • learner survey • on-the-job observation • review of peer coaching arrangements.

Unit Sector(s)

Unit sector	Delivery and facilitation
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		

TAEDEL402A Plan, organise and facilitate learning in the workplace

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to plan, organise and facilitate learning for individuals in a workplace.
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Application of the Unit

Application of the unit	This unit typically applies to a person working as an entry level trainer, teacher or facilitator, team leader or workplace supervisor, or any employee responsible for guiding learning through work.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Establish effective work environment for learning	1.1. Establish and agree upon objectives and scope of the work-based learning 1.2. Analyse work practices and routines to determine their effectiveness in meeting established learning objectives 1.3. Identify and address <i>OHS implications</i> of using work as the basis for learning
2. Develop a work-based learning pathway	2.1. Address <i>contractual requirements</i> and responsibilities for learning at work 2.2. Arrange for integration and monitoring of external learning activities with the <i>work-based learning pathway</i> 2.3. Obtain agreement from relevant personnel to implement the work-based learning pathway
3. Establish the learning-facilitation relationship	3.1. Identify context for learning and individual's learning style 3.2. Select appropriate technique or process to facilitate learning and explain the basis of the technique to learner 3.3. Develop, document and discuss <i>individualised learning plan</i> with learner 3.4. Access, read and interpret documentation outlining the OHS responsibilities of the various parties in the learning environment 3.5. Monitor supervisory arrangements appropriate to learner's levels of knowledge, skill and experience to provide support and encouragement and ensure

ELEMENT	PERFORMANCE CRITERIA
	learner's health and safety
4. Implement work-based learning pathway	4.1. Sequence introduction of workplace tasks, activities and processes to reflect the agreed work-based learning pathway 4.2. Explain objectives of work-based learning and the processes involved to learner 4.3. Encourage learner to take responsibility for learning and to self-reflect 4.4. Develop techniques that facilitate learner's transfer of skills and knowledge
5. Maintain and develop the learning/facilitation relationship	5.1. Prepare for each session 5.2. Structure learning activities to support and reinforce new learning, build on strengths, and identify areas for further development 5.3. Observe learner cues and change approaches where necessary to maintain momentum 5.4. Practise <i>ethical behaviour</i> at all times 5.5. Monitor effectiveness of the learning/facilitation relationship through regular meetings between the parties
6. Close and evaluate the learning/facilitation relationship	6.1. Carry out the closure smoothly, using appropriate interpersonal and communication skills 6.2. Seek feedback from learner on the outcomes achieved and value of the relationship 6.3. Evaluate and document process, including <i>impact, self evaluation and reflection</i> , and file according to legal and organisational requirements
7. Monitor and review the effectiveness of the work-based learning pathway	7.1. Document work performance and learning achievement and keep records according to organisational requirements 7.2. Evaluate effectiveness of the work-based pathway against the objectives, processes and techniques used 7.3. Recommend improvements to work-based practice in light of the review process

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- oral communication and language skills to:
 - motivate the learner
 - transfer skills and knowledge
- interpersonal skills to maintain appropriate relationships
- observation skills to monitor individual progress
- literacy skills to:
 - read and interpret organisational documents, legal documents and contracts
 - complete and maintain documentation
- organisational skills to provide guidance and feedback to individuals
- communication skills, including:
 - using effective verbal and non-verbal language
 - using critical listening and questioning techniques
 - giving constructive and supportive feedback
 - assisting learners to paraphrase advice or instructions back to the trainer/facilitator
 - providing clear and concrete options and advice
 - using appropriate industry/profession terminology and language
 - ensuring language, literacy and numeracy used is appropriate to learners

Required knowledge

- systems, processes and practices within the organisation where work-based learning is taking place
- operational demands of the work and impact of changes on work roles
- organisational work culture, including industrial relations environment
- systems for identifying skill needs
- introductory knowledge of different learning styles and how to encourage learning in each, for example:
 - visual learners
 - audio learners
 - kinaesthetic learners
 - theoretical learners
- relevant policy, legislation, codes of practice and national standards that may affect training and assessment in the vocational education and training sector
- OHS relating to the work role, including:
 - hazards relating to the industry and specific workplace
 - reporting requirements for hazards and incidents

REQUIRED SKILLS AND KNOWLEDGE

- specific procedures for work tasks
- safe use and maintenance of relevant equipment
- emergency procedures
- sources of OHS information

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

Assessment must address the scope of this unit and reflect all components of the unit. A range of appropriate assessment methods and evidence-gathering techniques must be used to determine competency. A judgement of competency should only be made when the assessor is confident that the required outcomes of the unit have been achieved and that consistent performance has been demonstrated.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of the ability to:

- prepare and facilitate work-based learning
- provide evidence of a minimum of two examples of developing work-based learning pathways, that include:
 - identifying needs for learning
 - analysing work practices, work environment and work activities
 - organising and allocating work in a way that reflects learning needs and provides effective learning opportunities through work processes
- provide a minimum of two examples of a learning facilitation relationship being conducted:
 - with different individuals
 - demonstrating communication skills and flexibility
 - demonstrating one or more of the processes or techniques identified.

Context of and specific resources for assessment

Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.

EVIDENCE GUIDE	
	Assessment must ensure access to information about work activities.
Method of assessment	
Guidance information for assessment	For further information about assessment of this and other TAE units, refer to relevant implementation guidance published on the IBSA website (www.ibsa.org.au).

Range Statement

RANGE STATEMENT	
<p>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.</p>	
<i>OHS implications</i> may include:	<ul style="list-style-type: none"> • OHS obligations • workplace OHS policies and procedures • ensuring work practices, routines and proposed changes do not pose a risk to learners and others.
<i>Contractual requirements</i> may include:	<ul style="list-style-type: none"> • training plans under apprenticeships/traineeships • requirements of government-funded training programs, such as Workplace English Language and Literacy (WELL).
<i>Work-based learning pathway</i> may include:	<ul style="list-style-type: none"> • identifying specific goals for work-based learning • identifying job tasks or activities to be included in learning process • appropriate sequencing of job tasks/activities to reflect learner incremental development • direct guidance and modelling from experienced co-workers and experts • opportunities for practice.
<i>Individualised learning plan</i> may include:	<ul style="list-style-type: none"> • information about individual's learning style, learner characteristics, and the context for learning • clear boundaries and expectations of the learning/facilitation relationship • documented equity or additional support needs for the learner

RANGE STATEMENT	
	<ul style="list-style-type: none"> • performance benchmarks to be achieved • activities and processes which together will achieve the benchmarks.
<i>Ethical behaviour</i> includes:	<ul style="list-style-type: none"> • trust • integrity • privacy and confidentiality of the session • following organisational policies • knowing own limitations • having a range of other intervention referrals ready when needed • honesty • fairness to others.
<i>Impact</i> may be:	<ul style="list-style-type: none"> • successful achievement, rate of achievement, or lack of achievement of identified goals • achievement of other outcomes as a result of the relationship • development of new goals • new or increased motivation to learn • greater capacity to learn • increase in learner's self-confidence.
<i>Self-evaluation and reflection</i> may include:	<ul style="list-style-type: none"> • asking critical questions about: <ul style="list-style-type: none"> • own ability • what worked or didn't work • how the relationship building process could be improved • reviewing records and journals on sessions and critically evaluating own performance • reviewing feedback from learner and identifying critical aspects and areas for improvement.

Unit Sector(s)

Unit sector	Delivery and facilitation
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		

TAEDES401A Design and develop learning programs

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to conceptualise, design, develop and review learning programs to meet an identified need for a group of learners. The unit addresses the skills and knowledge needed to identify the parameters of a learning program, determine the design, outline the content and review its effectiveness.
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Application of the Unit

Application of the unit	This unit typically applies to a trainer or facilitator who designs or develops learning programs. A learning program can be discrete, providing a planned learning approach that relates to specific learning and training needs, or it may form part of the learning design for a qualification.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Define parameters of the learning program	1.1. Clarify <i>purpose</i> and type of learning program with key stakeholders 1.2. Access and confirm the competency standards and <i>other training specifications</i> on which to base the learning program 1.3. Identify language, literacy and numeracy requirements of the program 1.4. Identify and consider characteristics of the target learner group
2. Work within the vocational education and training (VET) policy framework	2.1. Access relevant <i>VET policies</i> and frameworks, and apply to work practices 2.2. Identify changes to training packages and accredited courses and apply these to program development 2.3. Conduct work according to organisational quality assurance policies and procedures
3. Develop program content	3.1. Research, develop and document specific subject matter content according to agreed design options 3.2. Evaluate existing learning resources for content relevance and quality 3.3. Specify assessment requirements of the learning program
4. Design structure of the learning program	4.1. Break the learning content into manageable segments and document timeframe for each segment

ELEMENT	PERFORMANCE CRITERIA
	<p>4.2. Determine and confirm <i>delivery strategies</i> and required assessment methods and tools</p> <p>4.3. Document complete learning program in line with organisational requirements</p> <p>4.4. Review complete program with key stakeholders and adjust as required</p> <p>4.5. Ensure a safe learning progression by analysing risks in the learning environment and including a risk control plan</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- organisational skills to ensure resources are available and suitable
- evaluation skills to determine the time required for each learning segment and the overall timelines of the learning program
- cognitive skills to develop the learning program content and design its structure
- language and literacy skills to read and interpret a range of documentation, including technical and subject matter documents, references and texts

Required knowledge

- information about training package developers and course accreditation agencies responsible for specific learning program parameters
- training packages and relevant competency standards to be used as the basis of the learning program
- other performance standards and criteria to be used as the basis of the learning program, where relevant
- distinction and relationship between a training package/accredited course, learning strategy and learning program, where linked
- different purposes and focus of learning programs
- sound knowledge of learning principles
- instructional design principles relating to different design options for learning program design and structure
- availability and types of different relevant learning resources, learning materials and pre-developed learning activities
- methodology relating to developing and documenting new learning activities and

REQUIRED SKILLS AND KNOWLEDGE

related learning materials

- different delivery modes and methods
- relevant policies, legal requirements, codes of practice and national standards, including commonwealth and state or territory legislation that may affect training and assessment in the VET sector
- relevant OHS knowledge relating to the work role, and OHS considerations that need to be included in the learning program

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	Assessment must address the scope of this unit and reflect all components of the unit. Arrange of appropriate assessment methods and evidence-gathering techniques must be used to determine competency. A judgement of competency should only be made when the assessor is confident that the required outcomes of the unit have been achieved and that consistent performance has been demonstrated.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: <ul style="list-style-type: none"> • design, develop and review learning programs within the VET context • prepare and develop a minimum of two learning programs: <ul style="list-style-type: none"> • that contain differentiated learning program designs to reflect particular needs, contexts and timelines • at least one of which must be based on competency standards or accredited courses and must cover at least one entire unit of competency or accredited course module.
Context of and specific resources for assessment	Evidence must be gathered in the workplace whenever possible. Where no workplace is available, a simulated workplace must be provided.
Method of assessment	
Guidance information for assessment	For further information about assessment of this and other TAE units, refer to relevant implementation guidance published on the

EVIDENCE GUIDE

	IBSA website (www.ibsa.org.au).
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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.

<i>Purpose</i> may include:	<ul style="list-style-type: none"> • developing vocational competency or vocational skills • developing language, literacy and numeracy skills • developing general education • meeting legislative, licensing and registration requirements, such as OHS requirements.
<i>Other training specifications</i> may include:	<ul style="list-style-type: none"> • curriculum specifications • product specifications • organisational work requirements and training needs • induction needs • language, literacy and numeracy development needs • regulatory and licensing requirements.
<i>Vocational education and training policies</i> may include:	<ul style="list-style-type: none"> • policies and procedures set by national organisations, such as the National Quality Council • Australian Quality Training Framework • other relevant policies.
<i>Delivery strategies</i> may include:	<ul style="list-style-type: none"> • focus of delivery in terms of size and type of group • context of delivery, for example: <ul style="list-style-type: none"> • in the workplace • in a training room • in a community setting • mode of delivery, for example: <ul style="list-style-type: none"> • face-to-face • online • blended delivery mode • delivery methods, for example: <ul style="list-style-type: none"> • lock-step, learner-paced and mixed

RANGE STATEMENT

	<ul style="list-style-type: none"> • interactive, participative and collaborative • blended delivery methods.
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Unit Sector(s)

Unit sector	Learning design
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		

MEA Aeroskills Training Package

Modification History

Release	Release date	Comment
Release 1.4	23 December, 2016	<p>Minor IRC upgrade</p> <p>Qualification Description for MEA41015 revised to comply with CASA licensing requirements. No change to outcomes.</p>
Release 1.3	18 November, 2015	<p>ISC upgrade</p> <p>Minor changes to three (3) qualifications to correct typographical errors in unit titles in packaging rules*:</p> <ul style="list-style-type: none"> • MEA20415 Certificate II in Aeroskills • MEA20615 Certificate II in Aircraft Surface Finishing • MEA40615 Certificate IV in Aeroskills (Avionics) <p>*No changes required to units.</p> <p>Minor changes to seven (7) units of competency required by CASA/ADF to meet regulatory requirements (no change of outcomes):</p> <ul style="list-style-type: none"> • MEA317 Remove and install pressurised aircraft structural and non-structural components • MEA372 Perform mechanical elementary maintenance • MEA410 Maintain aircraft structure/components • MEA420 Fabricate basic structural components for aircraft • MEA421 Fabricate advanced structural components for aircraft • MEA422 Repair/modify aircraft metal structure • MEA423 Aircraft structure major disassembly and reassembly
Release 1.2	5 August, 2015	<p>ISC upgrade</p>

		<ul style="list-style-type: none"> • Inclusion of 41 new Skill Sets (utilising existing endorsed units). • Minor modifications to units MEA204, MEA212, MEA260 and MEA275 (refer to units for details).
Release 1.1	14 April, 2015	ISC upgrade <ul style="list-style-type: none"> • Inclusion of 172 new Skill Sets (utilising existing endorsed units). • Addition of 66 imported units for use in above Skill Sets. • New releases of MEA50215 and MEA60315 with editorial corrections to errors in packaging rules re total units required.
Release 1	12 February, 2015	Initial release

Credit Arrangements

At the time of endorsement of this Training Package no national credit arrangements exist.

Links

Companion Volume implementation guides are found in VETNet -
<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

MEASS00245 AMW001 Electrical component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA261	Use electronic test equipment
MEA262	Modify/repair single layer printed circuit boards
MEA286	Repair or overhaul aircraft electrical/electro-mechanical components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on electrical component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on electrical component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00246 AMW002 Mechanical and electro-mechanical instrument component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA252	Test, align and troubleshoot synchro and servo system components
MEA260	Use electrical test equipment
MEA261	Use electronic test equipment
MEA262	Modify/repair single layer printed circuit boards
MEA284	Repair or overhaul aircraft instrument system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on mechanical and electro-mechanical instruments repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on mechanical and electro-mechanical instruments repair and overhaul.

Custom Content Section

Not applicable.

MEASS00247 AMW003 Aircraft display, control and distribution system component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA252	Test, align and troubleshoot synchro and servo system components
MEA260	Use electrical test equipment
MEA261	Use electronic test equipment
MEA262	Modify/repair single layer printed circuit boards
MEA283	Repair or overhaul aircraft display, control and distribution system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on aircraft display, control and distribution system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on display, control and distribution system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00248 AMW004 Oxygen system component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA287	Repair or overhaul aircraft oxygen system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on oxygen system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on oxygen system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00249 AMW005 Aircraft radio frequency communication and navigation system component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA261	Use electronic test equipment
MEA262	Modify/repair single layer printed circuit boards
MEA285	Repair or overhaul aircraft radio frequency communication and navigation system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on aircraft radio frequency communication and navigation system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on radio frequency communication and navigation system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00250 AMW006 Aircraft pulse system component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA261	Use electronic test equipment
MEA262	Modify/repair single layer printed circuit boards
MEA282	Repair or overhaul aircraft pulse system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on aircraft pulse system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on pulse system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00251 AMW007 Aircraft audio and visual system and reproducer repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA261	Use electronic test equipment
MEA262	Modify/repair single layer printed circuit boards
MEA288	Repair or overhaul aircraft audio and visual systems and reproducers

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on audio and visual system and reproducer repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on audio and visual system and reproducer repair and overhaul.

Custom Content Section

Not applicable.

MEASS00252 AMW008 Hydraulic system component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA380	Repair and/or overhaul aircraft hydraulic system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on hydraulic component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on hydraulic system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00253 AMW009 Electro-hydraulic component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA380	Repair and/or overhaul aircraft hydraulic system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on electro-hydraulic component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on electro-hydraulic component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00254 AMW010 Pneumatic system component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA381	Repair and/or overhaul aircraft pneumatic system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on pneumatic component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on pneumatic system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00255 AMW011 Electro-pneumatic component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA381	Repair and/or overhaul aircraft pneumatic system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on electro-pneumatic component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on electro-pneumatic component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00256 AMW012 Fuel system component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA382	Repair and/or overhaul aircraft fuel system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on fuel system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment in aircraft component maintenance workshops on fuel system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00257 AMW013 Gas turbine engine air inlet and compressor module/component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA383	Repair and/or overhaul gas turbine engine air inlet and compressor components and/or modules

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on gas turbine engine air inlet and compressor module/component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on gas turbine engine air inlet and compressor module/component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00258 AMW014 Gas turbine engine combustion section module/component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA384	Repair and/or overhaul gas turbine engine combustion section components and/or modules

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on gas turbine engine combustion section module/component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on gas turbine engine combustion section module/component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00259 AMW015 Gas turbine engine turbine and exhaust module/component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA385	Repair and/or overhaul gas turbine engine turbine and exhaust section components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on gas turbine engine turbine and exhaust module/component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on gas turbine engine turbine and exhaust module/component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00260 AMW016 Gas turbine engine ancillary section module/component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA386	Repair and/or overhaul gas turbine engine ancillary section components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on gas turbine engine ancillary section module/component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on gas turbine engine ancillary section module/component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00261 AMW017 Piston engine disassembly for repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA392	Disassemble aircraft piston engines

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on aircraft piston engine disassembly for repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on piston engine disassembly.

Custom Content Section

Not applicable.

MEASS00262 AMW018 Repair and/or overhaul aircraft piston engine cylinder assembly components

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA393	Repair and/or overhaul aircraft piston engine cylinder assembly components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on the repair and overhaul of aircraft piston engine cylinder assembly components.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on piston engine cylinder assembly component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00263 AMW019 Repair and/or overhaul aircraft piston engine crankcase assembly components

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA394	Repair and/or overhaul aircraft piston engine crankcase assembly components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on the repair and overhaul of aircraft piston engine crankcase assembly components.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on piston engine crankcase assembly component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00264 AMW020 Reassemble aircraft piston engines

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA395	Reassemble aircraft piston engines

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on reassembly of aircraft piston engines.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on piston engine repair and overhaul.

Custom Content Section

Not applicable.

MEASS00265 AMW021 Assemble aircraft piston engine quick engine change unit

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA396	Assemble aircraft piston engine quick engine change unit

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on assembly of aircraft piston engine quick engine change units.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on assembly of piston engine quick engine change units.

Custom Content Section

Not applicable.

MEASS00266 AMW022 Test aircraft piston engines after repair or overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA392	Disassemble aircraft piston engines
MEA393	Repair and/or overhaul aircraft piston engine cylinder assembly components
MEA394	Repair and/or overhaul aircraft piston engine crankcase assembly components
MEA395	Reassemble aircraft piston engines
MEA396	Assemble aircraft piston engine quick engine change unit
MEA397	Test aircraft piston engines after repair or overhaul

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on testing of aircraft piston engines after repair or overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on testing of piston engines after repair or overhaul.

Custom Content Section

Not applicable.

MEASS00267 AMW023 Propeller repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA389	Repair and/or overhaul propellers

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on propeller repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on propeller repair and overhaul.

Custom Content Section

Not applicable.

MEASS00268 AMW024 Rotary wing dynamic component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA390	Repair and/or overhaul rotary wing dynamic components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on rotary wing dynamic component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on rotary wing dynamic component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00269 AMW025 Mechanical system component repair/overhaul

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers a Certificate IV qualification in Aeroskills that includes these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEA391	Repair and/or overhaul aircraft mechanical system components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on mechanical system component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on mechanical system component repair and overhaul.

Custom Content Section

Not applicable.

MEASS00270 AMW026 Composite structure maintenance

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Certificate IV in Aeroskills (Structures).

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA401	Inspect aircraft structures
MEA405	Repair/modify aircraft composite material structure/components

Target Group

Individuals with Certificate III or Certificate IV qualifications in an allied trade who are to be employed in aircraft component maintenance workshops on composite structural component repair and overhaul.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the grant of an approval to perform maintenance on aircraft composite structures.

Custom Content Section

Not applicable.

MEASS00271 LME001 Electrical – B1.1 Licence Exclusions E1 and E4 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA203	Remove and install advanced aircraft electrical systems and components
MEA223	Inspect aircraft electrical systems and components
MEA227	Test and troubleshoot aircraft electrical systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment

Target Group

Holders of CASA B1.1 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in electrical systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B1.1 licence.

Custom Content Section

Not applicable.

MEASS00272 LME002 Electrical B1.1 Licence Exclusions E1 and E4 Removal (small aircraft with gas turbine engine)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA274	Maintain basic light aircraft electrical systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment

Target Group

Holders of CASA B1.1 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft (with gas turbine engine) electrical systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B1.1 licence for basic light aircraft (with gas turbine engine) maintenance.

Custom Content Section

Not applicable.

MEASS00273 LME003 Electrical – B1.2, B1.3 or B1.4 Licence Exclusions E1 and E4 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA203	Remove and install advanced aircraft electrical systems and components
MEA211	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment

Target Group

Holders of CASA B1.2, 1.3 or B1.4 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify electrical system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B1.2, B1.3 or B1.4 licence.

Custom Content Section

Not applicable.

MEASS00274 LME004 Electrical – B1.2 or B1.4 Licence Exclusions E1 and E4 Removal (small aircraft/helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA274	Maintain basic light aircraft electrical systems and components

Target Group

Holders of CASA B1.2 or B1.4 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft and basic helicopter electrical systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B1.2 or B1.4 licence for basic light aircraft and basic helicopter maintenance.

Custom Content Section

Not applicable.

MEASS00275 LME005 Electrical – B2 Licence Exclusions E1 and E4 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA203	Remove and install advanced aircraft electrical systems and components
MEA223	Inspect aircraft electrical systems and components
MEA227	Test and troubleshoot aircraft electrical systems and components

Target Group

Holders of CASA B2 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in electrical systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00276 LME006 Electrical – B2 Licence Exclusions E1 and E4 Removal (small aircraft or helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA202	Remove and install basic aircraft electrical systems and components
MEA210	Inspect, test and troubleshoot basic aircraft electrical systems and components

Target Group

Holders of CASA B2 licences endorsed with electrical systems E1 and/or E4 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft and basic helicopter electrical systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of electrical systems exclusions E1 and/or E4 from a CASR Part 66 B2 licence for basic light aircraft and basic helicopter maintenance.

Custom Content Section

Not applicable.

MEASS00277 LME007 Airframe – B1.1 Licence Exclusion E2 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA302	Remove and install aircraft hydro-mechanical and landing gear system components
MEA303	Remove and install aircraft pneumatic system components
MEA305	Remove and install aircraft fixed wing flight control system components
MEA317	Remove and install pressurised aircraft structural and non-structural components
MEA318	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components
MEA320	Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components
MEA321	Test and troubleshoot aircraft fixed wing flight control systems and components
MEA323	Perform advanced troubleshooting in aircraft mechanical maintenance
MEA325	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications

MEA328	Maintain and/or repair aircraft mechanical components or parts
MEA339	Inspect, repair and maintain aircraft structures
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications

Target Group

Holders of CASA B1.1 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in airframe systems/structure.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from a CASR Part 66 B1.1 licence.

Custom Content Section

Not applicable.

MEASS00278 LME008 Airframe – B1.1 Licence Exclusion E2 Removal (small aircraft with gas turbine engine)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA351	Maintain airframe systems of basic light fixed wing aircraft
MEA364	Maintain and/or repair small aircraft mechanical components or parts
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications
MEA369	Inspect and maintain structures and related components of non-pressurised small aircraft
MEA370	Repair the structure of non-pressurised small aircraft

Target Group

Holders of CASA B1.1 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft airframe systems and structure.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from a CASR Part 66 B1.1 licence for maintenance of basic light aircraft with gas turbine engines.

Custom Content Section

Not applicable.

MEASS00279 LME009 Airframe – B1.2 Licence Exclusion E2 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA302	Remove and install aircraft hydro-mechanical and landing gear system components
MEA304	Remove and install non-pressurised aircraft structural and non-structural components
MEA305	Remove and install aircraft fixed wing flight control system components
MEA309	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components
MEA312	Inspect, test and troubleshoot aircraft fixed wing flight control systems and components
MEA325	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications
MEA328	Maintain and/or repair aircraft mechanical components or parts
MEA339	Inspect, repair and maintain aircraft structures
MEA354	Maintain light aircraft pneumatic systems

MEA365 Assess structural repair/modification requirements and evaluate structural repairs and modifications

Target Group

Holders of CASA B1.2 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on airframe systems/structure.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from a CASR Part 66 B1.2 licence.

Custom Content Section

Not applicable.

MEASS00280 LME010 Airframe – B1.2 Licence Exclusion E2 Removal (working on small aircraft)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA351	Maintain airframe systems of basic light fixed wing aircraft
MEA364	Maintain and/or repair small aircraft mechanical components or parts
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications
MEA369	Inspect and maintain structures and related components of non-pressurised small aircraft
MEA370	Repair the structure of non-pressurised small aircraft

Target Group

Holders of CASA B1.2 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic light aircraft airframe systems and structure.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from a CASR Part 66 B1.2 licence for basic light aircraft maintenance.

Custom Content Section

Not applicable.

MEASS00281 LME011 Airframe – B1.3 and B1.4 Licence Exclusion E2 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA302	Remove and install aircraft hydro-mechanical and landing gear system components
MEA303	Remove and install aircraft pneumatic system components
MEA304	Remove and install non-pressurised aircraft structural and non-structural components
MEA308	Remove and install rotary wing rotor and flight control system components
MEA309	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components
MEA310	Inspect, test and troubleshoot aircraft pneumatic systems and components
MEA316	Inspect, test and troubleshoot rotary wing rotor and control systems and components
MEA323	Perform advanced troubleshooting in aircraft mechanical maintenance
MEA325	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications

MEA328	Maintain and/or repair aircraft mechanical components or parts
MEA339	Inspect, repair and maintain aircraft structures
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications

Target Group

Holders of CASA B1.3 and B1.4 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in airframe systems/structure or being able to certify maintenance on airframe systems/structure.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from CASR Part 66 B1.3 and B1.4 licence.

Custom Content Section

Not applicable.

MEASS00282 LME012 Airframe – B1.4 Licence Exclusion E2 Removal (working on basic helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA352	Maintain basic rotary wing aircraft systems
MEA364	Maintain and/or repair small aircraft mechanical components or parts
MEA365	Assess structural repair/modification requirements and evaluate structural repairs and modifications
MEA369	Inspect and maintain structures and related components of non-pressurised small aircraft
MEA370	Repair the structure of non-pressurised small aircraft

Target Group

Holders of CASA B1.4 licences endorsed with an airframe exclusion E2 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance on basic helicopter airframe systems/structure.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E2 from CASR Part 66 B1.3 and B1.4 licences for basic helicopter maintenance.

Custom Content Section

Not applicable.

MEASS00283 LME013 Power Plant – B1.1 Licence Exclusion E3 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306	Remove and install engines and engine system components
MEA307	Remove and install propeller systems and components (applicable only where licence type ratings sought include propeller driven aircraft)
MEA315	Inspect, test and troubleshoot propeller systems and components (applicable only where licence ratings sought include propeller driven aircraft)
MEA319	Inspect gas turbine engine systems and components
MEA322	Test and troubleshoot gas turbine engine systems and components
MEA323	Perform advanced troubleshooting in aircraft mechanical maintenance

Target Group

Holders of CASA B1.1 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific power plant type training.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.1 licence.

Custom Content Section

Not applicable.

MEASS00284 LME014 Power Plant – B1.2 Licence Exclusion E3 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306 Remove and install engines and engine system components

MEA313 Inspect, test and troubleshoot piston engine systems and components

Target Group

Holders of CASA B1.2 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify piston engine maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.2 licence.

Custom Content Section

Not applicable.

MEASS00285 LME015 Power Plant – B1.2 Licence Exclusion E3 Removal (working on small aircraft)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA353 Maintain basic light aircraft engines and propellers

Target Group

Holders of CASA B1.2 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained before being able to certify maintenance on basic light aircraft engines and propellers.

Suggested words for Statement of Attainment

This unit of competency from the MEA Aeroskills Training Package meets the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.2 licence for maintenance of basic light aircraft engines and propellers

Custom Content Section

Not applicable.

MEASS00286 LME016 Power Plant – B1.3 Licence Exclusion E3 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306	Remove and install engines and engine system components
MEA319	Inspect gas turbine engine systems and components
MEA322	Test and troubleshoot gas turbine engine systems and components
MEA323	Perform advanced troubleshooting in aircraft mechanical maintenance

Target Group

Holders of CASA B1.3 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific power plant type training.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.3 licence.

Custom Content Section

Not applicable.

MEASS00287 LME017 Power Plant – B1.4 Licence Exclusion E3 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306 Remove and install engines and engine system components

MEA313 Inspect, test and troubleshoot piston engine systems and components

Target Group

Holders of CASA B1.4 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify helicopter piston engine maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.4 licence.

Custom Content Section

Not applicable.

MEASS00288 LME018 Power Plant – B1.4 Licence Exclusion E3 Removal (working on basic helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA353 Maintain basic light aircraft engines and propellers

Target Group

Holders of CASA B1.4 licences endorsed with a power plant exclusion E3 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained before being able to certify maintenance on engines of basic helicopters.

Suggested words for Statement of Attainment

This unit of competency from the MEA Aeroskills Training Package meets the requirements of CASA for the removal of power plant exclusion E3 from a CASR Part 66 B1.4 licence for basic helicopter engine maintenance.

Custom Content Section

Not applicable.

MEASS00289 LME019 Instrument – B1 Licence Exclusions E5 and E7 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA203	Remove and install advanced aircraft electrical systems and components
MEA211	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA343	Remove and install avionic system components

Target Group

Holders of CASA B1 licences endorsed with instrument E5 and/or E7 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in instrument-related avionic systems or before being able to certify maintenance in the case of non-rated aircraft types.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusions E5 and/or E7 from all CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00290 LME020 Instrument – B1.2 and B1.4 Licence Exclusions E5 and E7 Removal (small aircraft/helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA275	Maintain basic light aircraft instrument systems and components

Target Group

Holders of CASA B1.2 and B1.4 licences endorsed with instrument E5 and/or E7 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusions E5 and/or E7 from CASR Part 66 B1.2 and B1.4 licences for maintenance of basic light aircraft and helicopters.

Custom Content Section

Not applicable.

MEASS00291 LME021 Instrument – B2 Licence Exclusions E5 and E7 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA205	Remove and install advanced aircraft instrument system components
MEA207	Remove and install aircraft electronic system components
MEA224	Inspect aircraft instrument systems and components
MEA225	Inspect fixed wing aircraft automatic flight control systems and components
MEA226	Inspect aircraft electronic systems and components
MEA228	Test and troubleshoot aircraft instrument systems and components
MEA230	Test and troubleshoot fixed wing aircraft automatic flight control systems and components
MEA231	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components (may be taken instead of MEA225 and MEA230 where ratings sought are entirely helicopter)
MEA235	Perform advanced troubleshooting in aircraft avionic maintenance

Target Group

Holders of CASA B2 licences endorsed with instrument E5 and/or E7 exclusions who wish to have the exclusions removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in instrument-related avionic systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusions E5 and/or E7 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00292 LME022 Instrument and Radio – B1 Licence Exclusion E6 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA203	Remove and install advanced aircraft electrical systems and components
MEA211	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA343	Remove and install avionic system components

Target Group

Holders of CASA B1 licences endorsed with an instrument and radio E6 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in instrument-related avionic systems or before being able to certify maintenance in the case of non-rated aircraft types.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument and radio exclusion E6 from all CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00293 LME023 Instrument and Radio – B1.2 and 1.4 Licence Exclusion E6 Removal (small aircraft/helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA275	Maintain basic light aircraft instrument systems and components
MEA276	Maintain basic aircraft communication and radio navigation systems and components

Target Group

Holders of CASA B1.2 and B1.4 licences endorsed with an instrument and radio E6 exclusions who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument and radio exclusion E6 from CASR Part 66 B1.2 and B1.4 licences for maintenance of basic light aircraft and helicopters.

Custom Content Section

Not applicable.

MEASS00294 LME024 Instrument and Radio – B2 Licence Exclusion E6 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA205	Remove and install advanced aircraft instrument system components
MEA206	Remove and install aircraft basic radio communication and navigation system components
MEA207	Remove and install aircraft electronic system components
MEA224	Inspect aircraft instrument systems and components
MEA225	Inspect fixed wing aircraft automatic flight control systems and components
MEA226	Inspect aircraft electronic systems and components
MEA228	Test and troubleshoot aircraft instrument systems and components
MEA229	Test and troubleshoot aircraft radio frequency navigation and communications systems and components
MEA230	Test and troubleshoot fixed wing aircraft automatic flight control systems and components
MEA231	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components (may be taken instead of MEA225 and MEA230)

where ratings sought are entirely helicopter)

MEA232 Test and troubleshoot aircraft pulse systems and components

MEA235 Perform advanced troubleshooting in aircraft avionic maintenance

Target Group

Holders of CASA B2 licences endorsed with an instrument and radio E6 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in instrument and radio systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument and radio exclusion E6 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00295 LME025 Instrument and Radio – B2 Licence Exclusion E6 Removal (non-type rated aircraft/helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA205	Remove and install advanced aircraft instrument system components
MEA213	Inspect, test and troubleshoot advanced aircraft instrument systems
MEA289	Maintain basic light aircraft avionic systems and components

Target Group

Holders of CASA B2 licences involved only in the maintenance of non-type rated aircraft and helicopters whose licences are endorsed with an instrument and radio E6 exclusion and who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify instrument and radio systems maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument and radio exclusion E6 from a CASR Part 66 B2 licence for maintenance of non-type rated aircraft and helicopters.

Custom Content Section

Not applicable.

MEASS00296 LME026 Radio – B1 Licence Exclusion E8 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA203	Remove and install advanced aircraft electrical systems and components
MEA211	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA343	Remove and install avionic system components

Target Group

Holders of CASA B1 licences endorsed with a radio E8 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in instrument-related avionic systems or before being able to certify maintenance in the case of non-rated aircraft types.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E8 from all CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00297 LME027 Radio – B1.2 and B1.4 Licence Exclusion E8 Removal (working on small aircraft/helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA276	Maintain basic aircraft communication and radio navigation systems and components

Target Group

Holders of CASA B1.2 and B1.4 licences endorsed with a radio E8 exclusions who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument and radio exclusion E8 from CASR Part 66 B1.2 and B1.4 licences for maintenance of basic light aircraft and helicopters.

Custom Content Section

Not applicable.

MEASS00298 LME028 Radio – B2 Licence Exclusion E8 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206	Remove and install aircraft basic radio communication and navigation system components
MEA207	Remove and install aircraft electronic system components
MEA226	Inspect aircraft electronic systems and components
MEA229	Test and troubleshoot aircraft radio frequency navigation and communications systems and components
MEA232	Test and troubleshoot aircraft pulse systems and components
MEA235	Perform advanced troubleshooting in aircraft avionic maintenance

Target Group

Holders of CASA B2 licences endorsed with a radio E8 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in radio systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E8 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00299 LME029 Radio – B2 Licence Exclusion E8 Removal (non-type rated aircraft and helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA289 Maintain basic light aircraft avionic systems and components

Target Group

Holders of CASA B2 licences involved only in the maintenance of non-type rated aircraft and helicopters whose licences are endorsed with an instrument and radio E8 exclusion and who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify radio systems maintenance on non-type rated aircraft.

Suggested words for Statement of Attainment

This unit of competency from the MEA Aeroskills Training Package meets the requirements of CASA for the removal of radio exclusion E8 from a CASR Part 66 B2 licence for maintenance of non-type rated aircraft and helicopters.

Custom Content Section

Not applicable.

MEASS00300 LME030 Airframe – B1 Licence Exclusion E9 and E43 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA357 Inspect, test and repair aircraft fabric surfaces

Target Group

Holders of CASA B1 licences endorsed with an airframe exclusion E9 or E43 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify aircraft fabric surface maintenance.

Suggested words for Statement of Attainment

This unit of competency from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E9 or E43 from CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00301 LME031 Airframe – B1 Licence Exclusion E10 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA359 Inspect and repair aircraft wooden structures

Target Group

Holders of CASA B1 licences endorsed with an airframe exclusion E10 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify aircraft wooden structure maintenance.

Suggested words for Statement of Attainment

This unit of competency from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E10 from CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00302 LME032 Radio – B2 Licence Exclusion E11 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206	Remove and install basic radio communication and navigation system components
MEA215	Inspect, test and troubleshoot advanced aircraft communications systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E11 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify audio CVR system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E11 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00303 LME033 Airframe/Engine – B1.1 and B1.2 Licence Exclusion E12 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA307 Remove and install propeller systems and components

MEA315 Inspect, test and troubleshoot propeller systems and components

Target Group

Holders of CASA B1.1 or B1.2 licences endorsed with an engine or airframe exclusion E12 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify propeller system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe/engine exclusion E12 from CASR Part 66 B1.1 and B1.2 licences.

Custom Content Section

Not applicable.

MEASS00304 LME034 Airframe – B1 Licence Exclusion E13 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA302	Remove and install aircraft hydro-mechanical and landing gear system components
MEA309	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components

Target Group

Holders of CASA B1 licences endorsed with an airframe exclusion E13 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify hydraulic system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E13 from CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00305 LME035 Airframe – B1 Licence Exclusion E14 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA362	Maintain aircraft vapour cycle air conditioning systems

Target Group

Holders of CASA B1 licences endorsed with an airframe exclusion E14 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify vapour cycle air conditioning system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E14 from CASR Part 66 B1 licences.

Custom Content Section

Not applicable.

MEASS00306 LME036 Airframe – B1.1 and B1.3 Licence Exclusion E15 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA355	Maintain light aircraft air cycle air conditioning systems

Target Group

Holders of CASA B1.1 and B1.3 licences endorsed with an airframe exclusion E15 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify maintenance of air cycle air conditioning systems of unpressurised aircraft and helicopters.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E15 from CASR Part 66 B1.1 and B1.3 licences.

Custom Content Section

Not applicable.

MEASS00307 LME037 Airframe – B1.1 Licence Exclusion E15 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA203	Remove and install advanced aircraft electrical systems and components
MEA211	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA303	Remove and install aircraft pneumatic system components
MEA310	Inspect, test and troubleshoot aircraft pneumatic systems and components

Target Group

Holders of CASA B1.1 licences endorsed with an airframe exclusion E15 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in air cycle air conditioning systems of pressurised aircraft.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E15 from CASR Part 66 B1.1 licences.

Custom Content Section

Not applicable.

MEASS00308 LME038 Airframe – B1.1 Licence Exclusion E16 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA203	Remove and install advanced aircraft electrical systems and components
MEA208	Remove and install aircraft pressurisation control system components
MEA211	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA219	Inspect, test and troubleshoot aircraft pressurisation control systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA303	Remove and install aircraft pneumatic system components
MEA310	Inspect, test and troubleshoot aircraft pneumatic systems and components
MEA317	Remove and install pressurised aircraft structural and non-structural components

MEA323 Perform advanced troubleshooting in aircraft mechanical maintenance

Target Group

Holders of CASA B1.1 licences endorsed with an airframe exclusion E16 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before undergoing specific type training in pressurisation systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E16 from CASR Part 66 B1.1 licences.

Custom Content Section

Not applicable.

MEASS00309 LME039 Airframe – B1.2 Licence Exclusion E16 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA356	Maintain light piston engine aircraft pressurisation systems

Target Group

Holders of CASA B1.2 licences endorsed with an airframe exclusion E16 who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify pressurisation system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E16 from CASR Part 66 B1.2 licences.

Custom Content Section

Not applicable.

MEASS00310 LME040 Radio – B2 Licence Exclusion E18 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206	Remove and install aircraft basic radio communication and navigation system components
MEA214	Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E18 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify ADF system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E18 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00311 LME041 Radio – B2 Licence Exclusion E19 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206 Remove and install aircraft basic radio communication and navigation system components

MEA214 Inspect, test and troubleshoot aircraft basic communication and radio navigation systems and components

Or the following two units in lieu of MEA214:

MEA226 Inspect aircraft electronic systems and components

MEA229 Test and troubleshoot aircraft radio frequency navigation and communications systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E19 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify VOR system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E19 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00312 LME042 Radio – B2 Licence Exclusion E20 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206	Remove and install aircraft basic radio communication and navigation system components
MEA207	Remove and install aircraft electronic system components
MEA216	Inspect, test and troubleshoot instrument landing systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E20 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify ILS system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E20 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00313 LME043 Radio – B2 Licence Exclusion E21 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207	Remove and install aircraft electronic system components
MEA220	Inspect, test and troubleshoot aircraft primary radar systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E21 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify weather radar system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E21 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00314 LME044 Radio – B2 Licence Exclusion E22 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207	Remove and install aircraft electronic system components
MEA221	Inspect, test and troubleshoot aircraft secondary radar systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E22 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify ATC transponder system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E22 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00315 LME045 Radio – B2 Licence Exclusion E23 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207	Remove and install aircraft electronic system components
MEA221	Inspect, test and troubleshoot aircraft secondary radar systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E23 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify radio altimeter system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E23 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00316 LME046 Radio – B2 Licence Exclusion E24 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207	Remove and install aircraft electronic system components
MEA221	Inspect, test and troubleshoot aircraft secondary radar systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E24 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify DME system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E24 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00317 LME047 Radio – B2 Licence Exclusion E25 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207	Remove and install aircraft electronic system components
MEA221	Inspect, test and troubleshoot aircraft secondary radar systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E25 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify doppler system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E25 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00318 LME048 Radio – B2 Licence Exclusion E26 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206	Remove and install aircraft basic radio communication and navigation system components
MEA207	Remove and install aircraft electronic system components
MEA234	Inspect, test and troubleshoot aircraft global navigation systems and components

Target Group

Holders of CASA B2 licences endorsed with a radio E26 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify satellite navigation system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of radio exclusion E26 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00319 LME049 Instrument – B2 Licence Exclusion E27 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207	Remove and install aircraft electronic system components
MEA291	Inspect, test and troubleshoot fixed wing single axis autopilot systems and components

Target Group

Holders of CASA B2 licences endorsed with instrument E27 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify single axis autopilot system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusion E27 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00320 LME050 Instrument – B2 Licence Exclusion E28 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207 Remove and install aircraft electronic system components

MEA217 Inspect, test and troubleshoot fixed wing autopilot systems and components

Or, if helicopter systems are being maintained:

MEA218 Inspect, test and troubleshoot rotary wing autopilot systems and components

Target Group

Holders of CASA B2 licences endorsed with instrument E28 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify multi-axis autopilot system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusion E28 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00321 LME051 Instrument – B2 Licence Exclusion E29 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA205 Remove and install advanced aircraft instrument system components

MEA213 Inspect, test and troubleshoot advanced aircraft instrument systems

Target Group

Holders of CASA B2 licences endorsed with instrument E29 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify remote indicating compass system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusion E29 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00322 LME052 Instrument – B2 Licence Exclusion E30 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207	Remove and install aircraft electronic system components
MEA233	Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components

Target Group

Holders of CASA B2 licences endorsed with instrument E30 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify inertial navigation and reference system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusion E30 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00323 LME053 Instrument – B2 Licence Exclusion E31 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA208	Remove and install aircraft pressurisation control system components
MEA219	Inspect, test and troubleshoot aircraft pressurisation control systems and components

Target Group

Holders of CASA B2 licences endorsed with instrument E31 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify pressurisation system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of instrument exclusion E31 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00324 LME054 Electrical – B2 Licence Exclusion E32 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA202	Remove and install basic aircraft electrical systems and components
MEA210	Inspect, test and troubleshoot basic aircraft electrical systems and components
MEA277	Maintain twin engine aircraft electrical systems and components

Target Group

Holders of CASA B2 licences endorsed with electrical E32 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify maintenance of multi-generator power systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of electrical exclusion E32 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00325 LME055 Engine – B1.2 or B1.4 Licence Exclusions E33 and E38 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306	Remove and install engines and engine system components
MEA313	Inspect, test and troubleshoot piston engine systems and components

Target Group

Holders of CASA B1.2 or B1.4 licences endorsed with engine E33 or E38 exclusions who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify supercharging and/or turbocharging system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of engine exclusions E33 or E38 from a CASR Part 66 B1.2 or B1.4 licence.

Custom Content Section

Not applicable.

MEASS00326 LME056 Electrical/Instrument/Radio – B2 Licence Exclusion E34 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA207	Remove and install aircraft electronic system components
And any one of:	
MEA227	Test and troubleshoot aircraft electrical systems and components
MEA228	Test and troubleshoot aircraft instrument systems and components
MEA229	Test and troubleshoot aircraft radio frequency navigation and communications systems and components
MEA230	Test and troubleshoot fixed wing aircraft automatic flight control systems and components
MEA231	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components
MEA232	Test and troubleshoot aircraft pulse systems and components
MEA278	Inspect, test and troubleshoot instrument display systems and components

Target Group

Holders of CASA B2 licences endorsed with electrical/instrument/radio E34 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before either undergoing specific type training or being able to certify maintenance of digital electronic systems.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of electrical/instrument/radio exclusion E34 from a CASR Part 66 B2 licence.

Custom Content Section

Not applicable.

MEASS00327 LME057 Airframe – B1.1 or B1.2 Licence Exclusion E35 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA317	Remove and install pressurised aircraft structural and non-structural components
MEA339	Inspect, repair and maintain aircraft structures

Target Group

Holders of CASA B1.1 or B1.2 licences endorsed with airframe E35 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify pressurised structure maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E35 from a CASR Part 66 B1.1 or B1.2 licence.

Custom Content Section

Not applicable.

MEASS00328 LME058 Engine – B1.2 or B1.4 Licence Exclusions E36 and E37 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306	Remove and install engines and engine system components
MEA313	Inspect, test and troubleshoot piston engine systems and components

Target Group

Holders of CASA B1.2 or B1.4 licences endorsed with engine E36 or E37 exclusions who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify carburettor or fuel injection system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of engine exclusion E36 or E37 from a CASR Part 66 B1.2 or B1.4 licence.

Custom Content Section

Not applicable.

MEASS00329 LME059 Engine – B1.2 or B1.4 Licence Exclusions E36 and E37 Removal (small aircraft/helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA353 Maintain basic light aircraft engines and propellers

Target Group

Holders of CASA B1.2 or B1.4 licences endorsed with engine E36 or E37 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify carburettor or fuel injection system maintenance.

Suggested words for Statement of Attainment

This unit of competency from the MEA Aeroskills Training Package meets the requirements of CASA for the removal of engine exclusion E36 or E37 from a CASR Part 66 B1.2 or B1.4 licence.

Custom Content Section

Not applicable.

MEASS00330 LME060 Airframe – B1.1 or B1.3 Licence Exclusions E39 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA303	Remove and install aircraft pneumatic system components
MEA310	Inspect, test and troubleshoot aircraft pneumatic systems and components

Target Group

Holders of CASA B1.1 or B1.3 licences endorsed with airframe E39 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify airframe ice protection system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E39 from a CASR Part 66 B1.1 or B1.3 licence.

Custom Content Section

Not applicable.

MEASS00331 LME061 Airframe – B1.2 or B1.4 Licence Exclusion E39 Removal (small aircraft/helicopters)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA354 Maintain light aircraft pneumatic systems

Target Group

Holders of CASA B1.2 or B1.4 licences endorsed with airframe E39 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained before being able to certify airframe ice protection system maintenance.

Suggested words for Statement of Attainment

This unit of competency from the MEA Aeroskills Training Package meets the requirements of CASA for the removal of airframe exclusion E39 from a CASR Part 66 B1.2 or B1.4 licence.

Custom Content Section

Not applicable.

MEASS00332 LME062 Airframe – B1 Licence Exclusion E40 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA303	Remove and install aircraft pneumatic system components
MEA310	Inspect, test and troubleshoot aircraft pneumatic systems and components

Target Group

Holders of CASA B1 licences endorsed with airframe E40 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify airframe fire protection system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E40 from a CASR Part 66 B1 licence.

Custom Content Section

Not applicable.

MEASS00333 LME063 Airframe - B1 Licence Exclusion E41 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA209	Remove and install aircraft oxygen system components
MEA222	Inspect, test and troubleshoot aircraft oxygen systems and components

Target Group

Holders of CASA B1 licences endorsed with airframe E41 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify oxygen system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E41 from a CASR Part 66 B1 licence.

Custom Content Section

Not applicable.

MEASS00334 LME064 Airframe – B1 Licence Exclusion E42 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA202	Remove and install basic aircraft electrical systems and components
MEA210	Inspect, test and troubleshoot basic aircraft electrical systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components
MEA309	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components

Target Group

Holders of CASA B1 licences endorsed with airframe E42 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify landing gear retraction system maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of airframe exclusion E42 from a CASR Part 66 B1 licence.

Custom Content Section

Not applicable.

MEASS00335 LME065 Electrical – B1 Licence Exclusion E44 Removal

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment

Target Group

Holders of CASA B1 licences endorsed with electrical E44 exclusion who wish to have the exclusion removed from their licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained before being able to certify repairs to wiring.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the removal of electrical exclusion E44 from a CASR Part 66 B1 licence.

Custom Content Section

Not applicable.

MEASS00336 LME066 Units of competency for A1 licence if Certificate IV in Aeroskills (Mechanical) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A1 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

- | | |
|--------|---|
| MEA119 | Perform administrative processes to prepare for certification of civil aircraft A level line maintenance |
| MEA240 | Use electrical test equipment to perform basic electrical tests (Not required if elective MEA260 is held) |
| MEA264 | Remove and install aircraft electrical/avionic components during line maintenance |
| MEA265 | Remove and install general aircraft electrical hardware (Not required if elective MEA201 is held) |
| MEA344 | Remove and install aircraft components (Not required if electives MEA301, MEA302 and either MEA304 or MEA317 are held) |
| MEA345 | Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft (Not required if MEA301 plus either the five units MEA309, MEA310, MEA312, MEA314 and MEA339 or MEA401 OR the three units MEA318, MEA319 and MEA339 or MEA401 are held) |
| MEA418 | Perform basic repair of aircraft internal fittings during line maintenance (Not required if any one of MEA369, MEA339 or MEA370 is held) |

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) seeking the grant of an A1 licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A1 licence to individuals who hold a Certificate IV in Aeroskills (Mechanical).

Custom Content Section

Not applicable.

MEASS00337 LME067 Units of competency for A2 licence if Certificate IV in Aeroskills (Mechanical) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A2 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

- | | |
|--------|---|
| MEA119 | Perform administrative processes to prepare for certification of civil aircraft A level line maintenance |
| MEA240 | Use electrical test equipment to perform basic electrical tests (Not required if elective MEA260 is held) |
| MEA264 | Remove and install aircraft electrical/avionic components during line maintenance |
| MEA265 | Remove and install general aircraft electrical hardware (Not required if elective MEA201 is held) |
| MEA344 | Remove and install aircraft components (Not required if electives MEA301, MEA302 and either MEA304 or MEA317 are held) |
| MEA347 | Perform scheduled line maintenance activities on piston engine fixed wing aircraft (Not required if MEA301, MEA309, MEA312, MEA313 and MEA339 or MEA401 are held) |
| MEA418 | Perform basic repair of aircraft internal fittings during line maintenance (Not required if any one of MEA369, MEA339 or MEA370 is held) |

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) seeking the grant of an A2 licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A2 licence to individuals who hold a Certificate IV in Aeroskills (Mechanical).

Custom Content Section

Not applicable.

MEASS00338 LME068 Units of competency for A3 licence if Certificate IV in Aeroskills (Mechanical) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A3 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

- | | |
|--------|---|
| MEA119 | Perform administrative processes to prepare for certification of civil aircraft A level line maintenance |
| MEA240 | Use electrical test equipment to perform basic electrical tests (Not required if elective MEA260 is held) |
| MEA264 | Remove and install aircraft electrical/avionic components during line maintenance |
| MEA265 | Remove and install general aircraft electrical hardware (Not required if elective MEA201 is held) |
| MEA344 | Remove and install aircraft components (Not required if electives MEA301, MEA302, MEA308 and either MEA304 or MEA317 are held) |
| MEA346 | Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft (Not required if MEA301, MEA309, MEA310, MEA314 or MEA319, MEA316 and MEA339 or MEA401 are held) |
| MEA418 | Perform basic repair of aircraft internal fittings during line maintenance (Not required if any of MEA369, MEA339 or MEA370 are held) |

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) seeking the grant of an A3 licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A3 licence to individuals who hold a Certificate IV in Aeroskills (Mechanical).

Custom Content Section

Not applicable.

MEASS00339 LME069 Units of competency for A4 licence if Certificate IV in Aeroskills (Mechanical) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A4 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

- | | |
|--------|--|
| MEA119 | Perform administrative processes to prepare for certification of civil aircraft A level line maintenance |
| MEA240 | Use electrical test equipment to perform basic electrical tests (Not required if elective MEA260 is held) |
| MEA264 | Remove and install aircraft electrical/avionic components during line maintenance |
| MEA265 | Remove and install general aircraft electrical hardware (Not required if elective MEA201 is held) |
| MEA344 | Remove and install aircraft components (Not required if electives MEA301, MEA302, MEA308 and either MEA304 or MEA317 are held) |
| MEA348 | Perform scheduled line maintenance activities on piston engine rotary wing aircraft (Not required if MEA301, MEA309, MEA313, MEA316 and MEA339 or MEA401 are held) |
| MEA418 | Perform basic repair of aircraft internal fittings during line maintenance (Not required if any one of MEA369, MEA339 or MEA370 is held) |

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) seeking the grant of an A4 licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A4 licence to individuals who hold a Certificate IV in Aeroskills (Mechanical).

Custom Content Section

Not applicable.

MEASS00340 LME070 Units of competency for A1 licence if Certificate IV in Aeroskills (Avionics) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A1 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA264	Remove and install aircraft electrical/avionic components during line maintenance (Not required if MEA203 and MEA207 are held)
MEA344	Remove and install aircraft components
MEA345	Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft
MEA418	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with Certificate IV in Aeroskills (Avionics) seeking the grant of an A1 licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A1 licence to individuals who hold a Certificate IV in Aeroskills (Avionics).

Custom Content Section

Not applicable.

MEASS00341 LME071 Units of competency for A2 licence if Certificate IV in Aeroskills (Avionics) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A2 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

- | | |
|--------|--|
| MEA119 | Perform administrative processes to prepare for certification of civil aircraft A level line maintenance |
| MEA264 | Remove and install aircraft electrical/avionic components during line maintenance (Not required if MEA203 and MEA207 are held) |
| MEA344 | Remove and install aircraft components |
| MEA347 | Perform scheduled line maintenance activities on piston engine fixed wing aircraft |
| MEA418 | Perform basic repair of aircraft internal fittings during line maintenance |

Target Group

Individuals with Certificate IV in Aeroskills (Avionics) seeking the grant of an A2 licence. Note that requirements vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A2 licence to individuals who hold a Certificate IV in Aeroskills (Avionics).

Custom Content Section

Not applicable.

MEASS00342 LME072 Units of competency for A3 licence if Certificate IV in Aeroskills (Avionics) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A3 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA264	Remove and install aircraft electrical/avionic components during line maintenance (Not required if MEA203 and MEA207 are held)
MEA344	Remove and install aircraft components
MEA346	Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft
MEA418	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with Certificate IV in Aeroskills (Avionics) seeking the grant of an A3 licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A3 licence to individuals who hold a Certificate IV in Aeroskills (Avionics).

Custom Content Section

Not applicable.

MEASS00343 LME073 Units of competency for A4 licence if Certificate IV in Aeroskills (Avionics) is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A4 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA119	Perform administrative processes to prepare for certification of civil aircraft A level line maintenance
MEA264	Remove and install aircraft electrical/avionic components during line maintenance (Not required if MEA203 and MEA207 are held)
MEA344	Remove and install aircraft components
MEA348	Perform scheduled line maintenance activities on piston engine rotary wing aircraft
MEA418	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with Certificate IV in Aeroskills (Avionics) seeking the grant of an A4 licence. Note that requirements may vary according to the elective units taken for the Certificate IV.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A4 licence to individuals who hold a Certificate IV in Aeroskills (Avionics).

Custom Content Section

Not applicable.

MEASS00344 LME074 Units of competency for A1 licence if a B2 licence is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A1 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA344	Remove and install aircraft components
MEA345	Perform scheduled line maintenance activities on gas turbine engine fixed wing aircraft
MEA418	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with a B2 licence seeking the grant of an A1 licence.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A1 licence to individuals who hold a B2 licence.

Custom Content Section

Not applicable.

MEASS00345 LME075 Units of competency for A2 licence if a B2 licence is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A2 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA344	Remove and install aircraft components
MEA347	Perform scheduled line maintenance activities on piston engine fixed wing aircraft
MEA418	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with a B2 licence seeking the grant of an A2 licence.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A2 licence to individuals who hold a B2 licence.

Custom Content Section

Not applicable.

MEASS00346 LME076 Units of competency for A3 licence if a B2 licence is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A3 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA344	Remove and install aircraft components
MEA346	Perform scheduled line maintenance activities on gas turbine engine rotary wing aircraft
MEA418	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with a B2 licence seeking the grant of an A3 licence.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A3 licence to individuals who hold a B2 licence.

Custom Content Section

Not applicable.

MEASS00347 LME077 Units of competency for A4 licence if a B2 licence is held

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 66 requirements for the A4 licence and does not relate to attainment of an additional Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA344	Remove and install aircraft components
MEA348	Perform scheduled line maintenance activities on piston engine rotary wing aircraft
MEA418	Perform basic repair of aircraft internal fittings during line maintenance

Target Group

Individuals with a B2 licence seeking the grant of an A4 licence.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of an A4 licence to individuals who hold a B2 licence.

Custom Content Section

Not applicable.

MEASS00348 MTA001 Aircraft egress system maintenance

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Certificate IV in Aeroskills (Armament).

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA601	Maintain aircraft egress systems
DEFEO101D	Work safely with explosive ordnance

Target Group

Individuals who wish to gain approval to maintain egress systems that contain explosive ordnance that are fitted to civil registered aircraft, such as Warbirds.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the grant of an approval to perform maintenance on aircraft egress systems that contain explosive ordnance.

Custom Content Section

Not applicable.

MEASS00349 MTA002 In-flight entertainment system maintenance

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Certificate II in Aircraft Line Maintenance.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA264	Remove and install aircraft electrical/avionic components during line maintenance
MEA265	Remove and install general aircraft electrical hardware

Target Group

Individuals who are required to maintain aircraft in-flight entertainment systems (IFE).

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA, when combined with applicable IFE equipment vendor training, for the grant of an approval to perform maintenance on IFE.

Custom Content Section

Not applicable.

MEASS00350 MTA003 Borescope inspection approval

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers this unit as a skill set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA366 Perform borescope inspections

Target Group

Qualified Aircraft Maintenance Engineers seeking approval to perform borescope inspections on aircraft engines.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the grant of an approval to perform borescope inspections on aircraft engines.

Custom Content Section

Not applicable.

MEASS00351 MTA004 Aircraft composite structure repair/modification using hot and cold bonding

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Certificate IV in Aeroskills (Mechanical) and (Mechatronics) and of a Diploma of Aeroskills (Mechanical).

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA401 Inspect aircraft structures

Or

MEA339 Inspect, repair and maintain aircraft structures

Or

MEA369 Inspect and maintain structures and related components of non-pressurised small aircraft

MEA370 Repair the structure of non-pressurised small aircraft

MEA405 Repair/modify aircraft composite material structure/components

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) or holders of B1 Maintenance Certification Licences who require an approval to repair or modify aircraft composite structure using hot and/or cold bonding.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the grant of an approval to perform repairs and modifications on aircraft composite structures using hot and/or cold bonding.

Custom Content Section

Not applicable.

MEASS00352 MTA005 Aircraft composite structure repair/modification using cold bonding only

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Certificate IV in Aeroskills (Mechanical) and (Mechatronics).

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA401 Inspect aircraft structures

or

MEA339 Inspect, repair and maintain aircraft structures

or

MEA369 Inspect and maintain structures and related components of non-pressurised small aircraft

MEA370 Repair the structure of non-pressurised small aircraft

MEA367 Repair/modify aircraft composite structure using cold bonding

Target Group

Individuals with Certificate IV in Aeroskills (Mechanical) or holders of B1 Maintenance Certification Licences who require an approval to repair or modify aircraft composite structure using cold bonding only.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the grant of an approval to perform repairs and modifications on aircraft composite structures using cold bonding only.

Custom Content Section

Not applicable.

MEASS00353 MTA006 Aircraft welding using the gas welding process – aluminium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the gas welding process. The competency elements of MEA430 must be attained using the aluminium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities

MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA430	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld aluminium alloys using the gas welding process.

Custom Content Section

Not applicable.

MEASS00354 MTA007 Aircraft welding using the gas welding process – magnesium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloys using the gas welding process. The competency elements of MEA430 must be attained using the magnesium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities

MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA430	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld magnesium alloys using the gas welding process.

Custom Content Section

Not applicable.

MEASS00355 MTA008 Aircraft welding using the gas welding process – carbon and low alloy steels

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steels using the gas welding process. The competency elements of MEA430 must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance

MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA430	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld carbon and low alloy steels using the gas welding process.

Custom Content Section

Not applicable.

MEASS00356 MTA009 Aircraft welding using the gas welding process – corrosion and heat resisting steels

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the gas welding process. The competency elements of MEA430 must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance

MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA430	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld corrosion and heat resisting steels using the gas welding process.

Custom Content Section

Not applicable.

MEASS00357 MTA010 Aircraft welding using the gas welding process – nickel alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloys using the gas welding process. The competency elements of MEA430 must be attained using the nickel alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities

MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA430	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld nickel alloys using the gas welding process.

Custom Content Section

Not applicable.

MEASS00358 MTA011 Aircraft welding using the gas welding process – copper based alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of copper based alloys using the gas welding process. The competency elements of MEA430 must be attained using the copper based alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities

MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA430	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld copper based alloy aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld copper based alloys using the gas welding process.

Custom Content Section

Not applicable.

MEASS00359 MTA012 Aircraft welding using the gas welding process – titanium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of titanium alloys using the gas welding process. The competency elements of MEA430 must be attained using the titanium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05004C	Perform routine oxy acetylene welding
MEM05007C	Perform manual heating and thermal cutting
MEM05022C	Perform advanced welding using oxy acetylene welding process
MEM05026C	Apply welding principles
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities

MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA430	Gas weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld titanium alloy aircraft components using the gas welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and of the ADF for the grant of an approval to weld titanium alloys using the gas welding process.

Custom Content Section

Not applicable.

MEASS00360 MTA013 Aircraft welding using the braze welding process - aluminium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the braze welding process. The competency elements of MEA431 must be attained using the aluminium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA431	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld aluminium alloy aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00361 MTA014 Aircraft welding using the braze welding process - magnesium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloys using the braze welding process. The competency elements of MEA431 must be attained using the magnesium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA431	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld magnesium alloy aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00362 MTA015 Aircraft welding using the braze welding process - carbon and low alloy steels

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steel using the braze welding process. The competency elements of MEA431 must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA431	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld carbon and low alloy steel aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00363 MTA016 Aircraft welding using the braze welding process - corrosion and heat resisting steels

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the braze welding process. The competency elements of MEA431 must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA431	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld corrosion and heat resisting steel aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00364 MTA017 Aircraft welding using the braze welding process - nickel alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloy using the braze welding process. The competency elements of MEA431A must be attained using the nickel alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA431	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld nickel alloy aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00365 MTA018 Aircraft welding using the braze welding process - copper based alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of copper based alloy using the braze welding process. The competency elements of MEA431 must be attained using the copper based alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA431	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld copper based alloy aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld copper based alloy aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00366 MTA019 Aircraft welding using the braze welding process - titanium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of titanium alloy using the braze welding process. The competency elements of MEA431 must be attained using the titanium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEM05006C	Perform brazing and/or silver soldering
MEM05026C	Apply welding principles
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA431	Braze weld aircraft components

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld titanium alloy aircraft components using the braze welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld titanium alloy aircraft components using the braze welding process.

Custom Content Section

Not applicable.

MEASS00367 MTA020 Aircraft welding using the gas metal arc welding process - aluminium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the gas metal arc welding process. The competency elements of MEA433 must be attained using the aluminium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA433	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld aluminium alloy aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00368 MTA021 Aircraft welding using the gas metal arc welding process - magnesium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloy using the gas metal arc welding process. The competency elements of MEA433 must be attained using the magnesium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA433	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld magnesium alloy aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00369 MTA022 Aircraft welding using the gas metal arc welding process - carbon and low alloy steels

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steel using the gas metal arc welding process. The competency elements of MEA433 must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret occupational health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA433	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld carbon and low alloy steel aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00370 MTA023 Aircraft welding using the gas metal arc welding process - corrosion and heat resisting steel

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the gas metal arc welding process. The competency elements of MEA433 must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA433	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld corrosion and heat resisting steel aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00371 MTA024 Aircraft welding using the gas metal arc welding process - nickel alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloy using the gas metal arc welding process. The competency elements of MEA433 must be attained using the nickel alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA433	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld nickel alloy aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00372 MTA025 Aircraft welding using the gas metal arc welding process - copper based alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of copper based alloy using the gas metal arc welding process. The competency elements of MEA433 must be attained using the copper based alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA433	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld copper based alloy aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld copper based alloy aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00373 MTA026 Aircraft welding using the gas metal arc welding process - titanium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of titanium alloy using the gas metal arc welding process. The competency elements of MEA433 must be attained using the titanium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05043B	Perform welds to code standards using gas metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA433	Weld aircraft components using the gas metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld titanium alloy aircraft components using the gas metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld titanium alloy aircraft components using the gas metal arc welding process.

Custom Content Section

Not applicable.

MEASS00374 MTA027 Aircraft welding using the gas tungsten arc welding process - aluminium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the gas tungsten arc welding process. The competency elements of MEA432 must be attained using the aluminium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA432	Weld aircraft components using the gas tungsten arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the gas tungsten arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld aluminium alloy aircraft components using the gas tungsten arc welding process.

Custom Content Section

Not applicable.

MEASS00375 MTA028 Aircraft welding using the gas tungsten arc welding process - magnesium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloy using the gas tungsten arc welding process. The competency elements of MEA432 must be attained using the magnesium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA432	Weld aircraft components using the gas tungsten arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the gas tungsten arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld magnesium alloy aircraft components using the gas tungsten arc welding process.

Custom Content Section

Not applicable.

MEASS00376 MTA029 Aircraft welding using the gas tungsten arc welding process - carbon and low alloy steels

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steel using the gas tungsten arc welding process. The competency elements of MEA432 must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA432	Weld aircraft components using the gas tungsten arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the gas tungsten arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld carbon and low alloy steel aircraft components using the gas tungsten arc welding process.

Custom Content Section

Not applicable.

MEASS00377 MTA030 Aircraft welding using gas tungsten arc welding process - corrosion and heat resisting steel

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the gas tungsten arc welding process. The competency elements of MEA432 must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA432	Weld aircraft components using the gas tungsten arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the gas tungsten arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld corrosion and heat resisting steel aircraft components using the gas tungsten arc welding process.

Custom Content Section

Not applicable.

MEASS00378 MTA031 Aircraft welding using the gas tungsten arc welding process - nickel alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloy using the gas tungsten arc welding process. The competency elements of MEA432 must be attained using the nickel alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA432	Weld aircraft components using the gas tungsten arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the gas tungsten arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld nickel alloy aircraft components using the gas tungsten arc welding process.

Custom Content Section

Not applicable.

MEASS00379 MTA032 Aircraft welding using the plasma arc welding process - aluminium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the plasma arc welding process. The competency elements of MEA434 must be attained using the aluminium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA434	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld aluminium alloy aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00380 MTA033 Aircraft welding using the plasma arc welding process - magnesium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloy using the plasma arc welding process. The competency elements of MEA434 must be attained using the magnesium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA434	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld magnesium alloy aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00381 MTA034 Aircraft welding using the plasma arc welding process - carbon and low alloy steels

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steel using the plasma arc welding process. The competency elements of MEA434 must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA434	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld carbon and low alloy steel aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00382 MTA035 Aircraft welding using the plasma arc welding process - corrosion and heat resisting steels

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the plasma arc welding process. The competency elements of MEA434 must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA434	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld corrosion and heat resisting steel aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00383 MTA036 Aircraft welding using the plasma arc welding process - nickel alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloy using the plasma arc welding process. The competency elements of MEA434 must be attained using the nickel alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA434	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld nickel alloy aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00384 MTA037 Aircraft welding using the plasma arc welding process - copper based alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of copper based alloy using the plasma arc welding process. The competency elements of MEA434 must be attained using the copper based alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA434	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld copper based alloy aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld copper based alloy aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00385 MTA038 Aircraft welding using the plasma arc welding process - titanium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of titanium alloy using the plasma arc welding process. The competency elements of MEA434 must be attained using the titanium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05044B	Perform welds to code standards using gas tungsten arc welding
MEM05049B	Perform routine gas tungsten arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA434	Weld aircraft components using the plasma arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld titanium alloy aircraft components using the plasma arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld titanium alloy aircraft components using the plasma arc welding process.

Custom Content Section

Not applicable.

MEASS00386 MTA039 Aircraft welding using the manual metal arc welding process - aluminium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of aluminium alloys using the manual metal arc welding process. The competency elements of MEA435 must be attained using the aluminium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA435	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld aluminium alloy aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld aluminium alloy aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00387 MTA040 Aircraft welding using the manual metal arc welding process - magnesium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of magnesium alloy using the manual metal arc welding process. The competency elements of MEA435 must be attained using the magnesium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA435	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld magnesium alloy aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld magnesium alloy aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00388 MTA041 Aircraft welding using the manual metal arc welding process - carbon and low alloy steels

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of carbon and low alloy steel using the manual metal arc welding process. The competency elements of MEA435 must be attained using the carbon steel and low alloy steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA435	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld carbon and low alloy steel aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld carbon and low alloy steel aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00389 MTA042 Aircraft welding using manual metal arc welding process - corrosion and heat resisting steels

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of corrosion and heat resisting steel using the manual metal arc welding process. The competency elements of MEA435 must be attained using the corrosion and heat resisting steel parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA435	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld corrosion and heat resisting steel aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld corrosion and heat resisting steel aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00390 MTA043 Aircraft welding using the manual metal arc welding process - nickel alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of nickel alloy using the manual metal arc welding process. The competency elements of MEA435 must be attained using the nickel alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret occupational health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA435	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld nickel alloy aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld nickel alloy aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00391 MTA044 Aircraft welding using the manual metal arc welding process - copper based alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of copper based alloy using the manual metal arc welding process. The competency elements of MEA435 must be attained using the copper based alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA435	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld copper based alloy aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld copper based alloy aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00392 MTA045 Aircraft welding using the manual metal arc welding process - titanium alloys

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Skill Set designed to meet the requirements for CASA or ADF welding approvals for the welding of titanium alloy using the manual metal arc welding process. The competency elements of MEA435 must be attained using the titanium alloy parent metal group as listed in the Range of Conditions.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

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
MEM05046B	Perform welds to code standards using manual metal arc welding process
MEM05051A	Select welding processes
MEM05052A	Apply safe welding processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations
MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA435	Weld aircraft components using the manual metal arc welding process

Target Group

Individuals seeking approval under either the CASA or ADF Regulatory system to weld titanium alloy aircraft components using the manual metal arc welding process.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to weld titanium alloy aircraft components using the manual metal arc welding process.

Custom Content Section

Not applicable.

MEASS00393 MTA046 Liquid penetrant inspection approval for aerospace

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Diploma of Aeroskills (Non-Destructive Testing). The MEA units also count towards the Diploma and Advanced Diploma of Aviation Maintenance Management. The MEM units count towards Diploma qualifications in the Metal and Engineering Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24002B
MEM24002B	Perform penetrant testing
MEM24012C	Apply metallurgy principles

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform liquid penetrant inspection of aircraft structure and items of aeronautical product at AS 3669 Level 2.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform liquid penetrant inspections on aircraft structure and items of aeronautical product at AS 3669 Level 2.

Custom Content Section

Not applicable.

MEASS00394 MTA047 Magnetic particle inspection approval for aerospace

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Diploma of Aeroskills (Non-Destructive Testing). The MEA units also count towards the Diploma and Advanced Diploma of Aviation Maintenance Management. The MEM units count towards Diploma qualifications in the Metal and Engineering Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24004B
MEM24004B	Perform magnetic particle testing
MEM24012C	Apply metallurgy principles

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform magnetic particle inspection of aircraft structure and items of aeronautical product at AS 3669 Level 2.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform magnetic particle inspections on aircraft structure and items of aeronautical product at AS 3669 Level 2.

Custom Content Section

Not applicable.

MEASS00395 MTA048 Eddy current inspection approval for aerospace

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Diploma of Aeroskills (Non-Destructive Testing). The MEA units also count towards the Diploma and Advanced Diploma of Aviation Maintenance Management. The MEM units count towards Diploma qualifications in the Metal and Engineering Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24006B
MEM24006B	Perform eddy current testing
MEM24012C	Apply metallurgy principles

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform eddy current inspection of aircraft structure and items of aeronautical product at AS 3669 Level 2.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform eddy current inspections on aircraft structure and items of aeronautical product at AS 3669 Level 2.

Custom Content Section

Not applicable.

MEASS00396 MTA049 Ultrasonic inspection approval for aerospace

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Diploma of Aeroskills (Non-Destructive Testing). The MEA units also count towards the Diploma and Advanced Diploma of Aviation Maintenance Management. The MEM units count towards Diploma qualifications in the Metal and Engineering Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24008B
MEM24008B	Perform ultrasonic testing
MEM24012C	Apply metallurgy principles

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform ultrasonic inspection of aircraft structure and items of aeronautical product at AS 3669 Level 2.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform ultrasonic inspections on aircraft structure and items of aeronautical product at AS 3669 Level 2.

Custom Content Section

Not applicable.

MEASS00397 MTA050 Radiographic inspection approval for aerospace

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as part of a Diploma of Aeroskills (Non-Destructive Testing). The MEA units also count towards the Diploma and Advanced Diploma of Aviation Maintenance Management. The MEM units count towards Diploma qualifications in the Metal and Engineering Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24010B
MEM13013B	Work safely with ionising radiation
MEM24010B	Perform radiographic testing

MEM24012C Apply metallurgy principles

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform radiographic inspection of aircraft structure and items of aeronautical product at AS 3669 Level 2.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform radiographic inspections on aircraft structure and items of aeronautical product at AS 3669 Level 2.

Custom Content Section

Not applicable.

MEASS00398 MTA051 Basic visual liquid dye penetrant inspection approval for aerospace

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24001B
MEM24001B	Perform basic liquid dye penetrant testing

Target Group

Qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform basic visual liquid dye penetrant inspection of aircraft structure and items of aeronautical product.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform basic visual liquid dye penetrant inspections on aircraft structure and items of aeronautical product.

Custom Content Section

Not applicable.

MEASS00399 MTA052 Basic magnetic particle inspection approval for aerospace

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24003B
MEM24003B	Perform basic magnetic particle testing

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform basic magnetic particle inspection of aircraft structure and items of aeronautical product.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform basic magnetic particle inspections on aircraft structure and items of aeronautical product.

Custom Content Section

Not applicable.

MEASS00400 MTA053 Basic eddy current inspection approval for aerospace

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24005B
MEM24005B	Perform basic eddy current testing

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform basic eddy current inspection of aircraft structure and items of aeronautical product.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform basic eddy current inspections on aircraft structure and items of aeronautical product.

Custom Content Section

Not applicable.

MEASS00401 MTA054 Ultrasonic thickness testing inspection approval for aerospace

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24007B
MEM24007B	Perform ultrasonic thickness testing

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform ultrasonic thickness testing inspection of aircraft structure and items of aeronautical product.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform ultrasonic thickness testing inspections on aircraft structure and items of aeronautical product.

Custom Content Section

Not applicable.

MEASS00402 MTA055 Basic radiographic inspection approval for aerospace

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers these units as a Skill Set that meets regulatory requirements.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance Note: This unit is equivalent to MEM18001C as a prerequisite for MEM24009B
MEM13013B	Work safely with ionising radiation
MEM24009B	Perform basic radiographic testing

Target Group

Holders of aircraft engineer licences, qualified AMEs and aviation tradespersons employed on aircraft and component maintenance plus other tradespersons employed in component maintenance workshops seeking approval under either the CASA or ADF Regulatory system to perform basic radiographic inspection of aircraft structure and items of aeronautical product.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA and the ADF for the grant of an approval to perform basic radiographic inspections on aircraft structure and items of aeronautical product.

Custom Content Section

Not applicable.

MEASS00403 MTA056 Electroplate aeronautical product component parts

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM07001B	Perform operational maintenance of machines equipment
MEM08001B	Perform wire, jig and barrel load unload work
MEM08003C	Perform electroplating operations
MEM08018B	Electroplate engineering coatings
MEM13003B	Work safely with industrial chemicals and materials
MEM18001C	Use hand tools
MEM15004B	Perform inspection

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to electroplate aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on the electroplating of aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00404 MTA057 Produce anodised film on aluminium alloy components

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM08002C	Pre-treat work for subsequent surface coating
MEM08006B	Produce clear and/or coloured and/or sealed anodised film on aluminium

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to produce anodised film on aluminium alloy components.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on the production of anodised film on aluminium alloy components.

Custom Content Section

Not applicable.

MEASS00405 MTA058 Metal spray aeronautical product component parts

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM08002C	Pre-treat work for subsequent surface coating
MEM08004B	Finish work using wet, dry and vapour deposition methods
MEM13003B	Work safely with industrial chemicals and materials

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform metal spraying operations.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on metal spraying operations.

Custom Content Section

Not applicable.

MEASS00406 MTA059 Machine aeronautical product component parts (general)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM07002B	Perform precision shaping/planning/slotting operations
MEM07005C	Perform general machining
MEM07006C	Perform lathe operations
MEM07007C	Perform milling operations
MEM07021B	Perform complex lathe operations
MEM09002B	Interpret technical drawing
MEM12003B	Perform precision mechanical measurement
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform general machining of aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on general machining of aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00407 MTA060 Grind aeronautical product component parts

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM07005C	Perform general machining
MEM07008D	Perform grinding operations
MEM07010B	Perform tool and cutter grinding operations
MEM07012B	Perform complex grinding operations
MEM09002B	Interpret technical drawing
MEM12003B	Perform precision mechanical measurement
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform grinding operations on aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the Aeroskills Training Package MEA11 meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on grinding of aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00408 MTA061 Precision jig boring of aeronautical product component parts

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM07005C	Perform general machining
MEM07007C	Perform milling operations
MEM07009B	Perform precision jig boring operations
MEM09002B	Interpret technical drawing
MEM12003B	Perform precision mechanical measurement
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform precision jig boring of aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the Aeroskills Training Package MEA11 meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on precision jig boring of aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00409 MTA062 Complex milling of aeronautical product component parts

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM07005C	Perform general machining
MEM07007C	Perform milling operations
MEM07011B	Perform complex milling operations
MEM09002B	Interpret technical drawing
MEM12003B	Perform precision mechanical measurement
MEM12023A	Perform engineering measurement
MEM12024A	Perform computations
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform complex milling operations on aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on complex milling of aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00410 MTA063 Machine aeronautical product component parts using horizontal and/or vertical boring machines

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM07005C	Perform general machining
MEM07013B	Perform machining operations using horizontal and/or vertical boring machines
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform machining of aeronautical product component parts using horizontal and/or vertical boring machines.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on machining of aeronautical product component parts using horizontal and/or vertical boring machines.

Custom Content Section

Not applicable.

MEASS00411 MTA064 Machine aeronautical product component parts using NC/CNC machines

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM07015B	Set computer controlled machines/processes
MEM07016C	Set and edit computer controlled machines/processes
MEM07018C	Write basic NC/CNC programs
MEM07022C	Program CNC wire cut machine
MEM07024B	Operate and monitor machine processes
MEM07028B	Operate computer controlled machine processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to machine aeronautical product component parts using NC/CNC machines.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on machining of aeronautical product component parts using NC/CNC machines.

Custom Content Section

Not applicable.

MEASS00412 MTA065 Machine aeronautical product component parts using NC/CNC machining centres

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM07015B	Set computer controlled machines/processes
MEM07016C	Set and edit computer controlled machines/processes
MEM07018C	Write basic NC/CNC programs
MEM07019C	Program NC/CNC machine centre
MEM07020C	Program multiple spindle and/or multiple axis NC/CNC machining centre
MEM07024B	Operate and monitor machine processes
MEM07028B	Operate computer controlled machine processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement

MEM18001C Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to machine aeronautical product component parts using NC/CNC machining centres.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on machining of aeronautical product component parts using NC/CNC machines.

Custom Content Section

Not applicable.

MEASS00413 MTA066 Machine plastic aeronautical product component parts

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM07001B	Perform operational maintenance of machines equipment
MEM07024B	Operate and monitor machine processes
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM16006A	Organise and communicate information
MEM18001C	Use hand tools

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to machine plastic (including composite) aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on machining of plastic (including composite) aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00414 MTA067 Aeronautical product component parts – metal spinning lathe operations

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
MEM07030C	Perform metal spinning lathe operations (basic)
MEM07031C	Perform metal spinning lathe operations (complex)
MEM07032B	Use workshop machines for basic operations
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurement
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations

Target Group

Individuals with allied trade qualifications who are employed in CASR Part 145 AMOs and require approval to perform metal spinning lathe operations on aeronautical product component parts.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals with Certificate III or Certificate IV qualifications in an allied trade in aircraft component maintenance workshops on metal spinning lathe operations on aeronautical product component parts.

Custom Content Section

Not applicable.

MEASS00415 MTA068 Aircraft tyre retreading (basic)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

- PMBPROD262B Operate tyre curing equipment
- PMBPROD263B Operate tyre retread curing equipment
- PMBPROD264C Check recycle wash process
- PMBPROD265C Operate portable vulcanising equipment
- PMBPROD266B Prepare tyre casing for retreading

Target Group

Individuals who are employed in CASR Part 145 AMOs and require approval to prepare tyres for retreading and operate aircraft tyre retreading equipment.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of individuals in aircraft tyre retreading, including preparation of tyres and operation of retreading equipment.

Custom Content Section

Not applicable.

MEASS00416 MTA069 Aircraft tyre retreading (advanced)

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to assist in compliance with CASR Part 145 and does not relate to an Aeroskills qualification.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA108	Complete aviation maintenance industry documentation
MEA145	Conversion from allied trades for employment in aviation maintenance workshops
PMBPROD324B	Inspect tyres for retreading
PMBPROD325B	Lay on tyre retreads
PMBPROD326B	Inspect tyres

Target Group

Individuals with applicable trade qualifications who are employed in CASR Part 145 AMOs and require approval to select tyres for retreading, set up retreading equipment and inspect tyres for serviceability following retreat.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for employment of trade qualified individuals in aircraft tyre inspection before and after retreading, and in setting up retreading equipment.

Custom Content Section

Not applicable.

MEASS00417 SAL001 B1 Small aircraft elementary maintenance

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

This Skill Set has been developed to define the units of competency that need to be attained by the end of two years of training for the Certificate IV in Aeroskills (Mechatronics) in order to qualify for the grant by CASA of a B1 small aircraft maintenance licence for the performance of elementary maintenance.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA101	Interpret work health and safety practices in aviation maintenance
MEA103	Plan and organise aviation maintenance work activities
MEA105	Apply quality standards applicable to aviation maintenance processes
MEA107	Interpret and use aviation maintenance industry manuals and specifications
MEA108	Complete aviation maintenance industry documentation
MEA109	Perform basic hand skills, standard trade practices and fundamentals in aviation maintenance
MEA111	Perform administrative processes to prepare for certification of civil aircraft maintenance
MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment

MEA274	Maintain basic light aircraft electrical systems and components
MEA276	Maintain basic light aircraft communication and radio navigation systems and components
MEA301	Perform aircraft flight servicing
MEA369	Inspect and maintain structures and related components of non-pressurised small aircraft
MEA372	Perform mechanical elementary maintenance

Target Group

Individuals who have completed two years of training for Certificate IV in Aeroskills (Mechatronics) and who are seeking the grant of a B1 small aircraft maintenance licence for the performance of elementary maintenance.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the grant of a B1 small aircraft maintenance licence for the performance of elementary maintenance to individuals who have completed two years of training for a Certificate IV in Aeroskills (Mechatronics).

Custom Content Section

Not applicable.

MEASS00418 SAL002 Mechanical/Avionic - B1 and B2 Electrical systems multi-generator - Raing 2

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA202	Remove and install basic aircraft electrical systems and components
MEA210	Inspect, test and troubleshoot basic aircraft electrical systems and components
MEA277	Maintain twin engine aircraft electrical systems and components

Target Group

Holders of CASA B1 or B2 small aircraft licences who wish to gain the electrical systems multi-generator rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the electrical systems multi-generator rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the electrical systems multi-generator additional rating for the B1 Small Aircraft licences.

Custom Content Section

Not applicable.

MEASS00419 SAL003 Mechanical – B1.2 Wooden structures - Rating 3

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA359 Inspect and repair aircraft wooden structures

Target Group

Holders of CASA B1.2 small aircraft licences who wish to gain the wooden structures rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the wooden structures rating.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the wooden structures additional rating for the B1.2 Small Aircraft licences.

Custom Content Section

Not applicable.

MEASS00420 SAL004 Mechanical – B1.2 Fabric surfaces - Rating 4

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA357 Inspect, test and repair aircraft fabric surfaces

Target Group

Holders of CASA B1.2 small aircraft licences who wish to gain the fabric surfaces rating. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the fabric rating.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the fabric surfaces additional rating for the B1.2 Small Aircraft licences.

Custom Content Section

Not applicable.

MEASS00421 SAL005 Mechanical – B1 Hydraulic systems - Rating 5

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA302	Remove and install aircraft hydro-mechanical and landing gear system components
MEA309	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components

Target Group

Holders of CASA B1 small aircraft licences who wish to gain the hydraulic systems rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the hydraulic systems rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the hydraulic systems additional rating for the B1 Small Aircraft licences.

Custom Content Section

Not applicable.

MEASS00422 SAL006 Mechanical – B1 Vapour cycle air conditioning systems - Rating 6A

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA362 Maintain aircraft vapour cycle air conditioning systems

Target Group

Holders of CASA B1 small aircraft licences who wish to gain the vapour cycle air conditioning systems rating. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the vapour cycle air conditioning systems rating.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the vapour cycle air conditioning systems additional rating for B1 small aircraft licences

Custom Content Section

Not applicable.

MEASS00423 SAL007 Mechanical – B1.1 and B1.3 Air cycle air conditioning systems - Rating 6B

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA355 Maintain light aircraft air cycle air conditioning systems

Target Group

Holders of CASA B1.1 or B1.3 small aircraft licences who wish to gain the air cycle air conditioning systems rating. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the air cycle air conditioning systems rating.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the air cycle air conditioning systems additional rating for the B1.1 and B1.3 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00424 SAL008 Mechanical/Avionics – B1 and B2 Oxygen systems – Rating 8

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA209 Remove and install aircraft oxygen system components

MEA222 Inspect, test and troubleshoot aircraft oxygen systems and components

Target Group

Holders of CASA B1 or B2 small aircraft licences who wish to gain the oxygen systems rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the oxygen systems rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the oxygen systems additional rating for the B1 and B2 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00425 SAL009 Mechanical – B1.1 and B1.2 Pressurisation and pneumatic systems – Rating 10

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA317	Remove and install pressurised aircraft structural and non-structural components
MEA339	Inspect, repair and maintain aircraft structures
MEA354	Maintain light aircraft pneumatic systems
MEA356	Maintain light piston engine aircraft pressurisation systems

Target Group

Holders of CASA B1.1 or B1.2 small aircraft licences who wish to gain the pressurisation systems rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the pressurisation systems rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the pressurisation systems additional rating for B1.1 and B1.2 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00426 SAL010 Mechanical – B1.3 and B1.4 Helicopter powered flight control systems – Rating 11

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA302	Remove and install aircraft hydro-mechanical and landing gear system components
MEA308	Remove and install rotary wing rotor and flight control system components
MEA316	Inspect, test and troubleshoot rotary wing rotor and control systems and components

Target Group

Holders of CASA B1.3 or B1.4 small aircraft licences who wish to gain the helicopter powered flight control systems rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the helicopter powered flight controls systems rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the helicopter powered flight control systems additional rating for the B1.3 and B1.4 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00427 SAL011 Mechanical – B1 Boosted induction systems – Rating S

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306 Remove and install engines and engine system components

MEA313 Inspect, test and troubleshoot piston engine systems and components

Target Group

Holders of CASA B1.2 or B1.4 small aircraft licences who wish to gain the boosted induction systems rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the boosted induction systems rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the boosted induction systems additional rating for the B1.2 and B1.4 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00428 SAL012 Mechanical – B1.2 Constant speed and variable pitch propeller - Rating V

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

- | | |
|--------|--|
| MEA307 | Remove and install propeller systems and components (applicable only where licence type ratings sought include propeller driven aircraft) |
| MEA313 | Inspect, test and troubleshoot piston engine systems and components |
| MEA315 | Inspect, test and troubleshoot propeller systems and components (applicable only where licence ratings sought include propeller driven aircraft) |

Target Group

Holders of CASA B1.2 small aircraft licences who wish to gain the constant speed and variable pitch propeller rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the constant speed and variable pitch propeller rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the constant speed and variable pitch propeller additional rating for the B1.2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00429 SAL013 Avionics – B2 Electrical 1 Rating

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA202	Remove and install basic aircraft electrical systems and components
MEA207	Remove and install aircraft electronic system components
MEA210	Inspect, test and troubleshoot basic aircraft electrical systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA290	Fit avionic modification sheet metal components
MEA301	Perform aircraft flight servicing

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the Electrical 1 rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the Electrical 1 rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the Electrical 1 additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00430 SAL014 Avionics – B2 Instrument 1 Rating

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA204	Remove and install basic aircraft instrument system components
MEA207	Remove and install aircraft electronic system components
MEA212	Inspect, test and troubleshoot basic aircraft instrument systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA290	Fit avionic modification sheet metal components
MEA301	Perform aircraft flight servicing

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the Instrument 1 rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the Instrument 1 rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the Instrument 1 additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00431 SAL015 Avionics – B2 Radio 1 Rating

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA201	Remove and install miscellaneous aircraft electrical hardware/components
MEA206	Remove and install basic aircraft basic radio communication and navigation system components
MEA207	Remove and install aircraft electronic system components
MEA216	Inspect, test and troubleshoot instrument landing systems and components
MEA246	Fabricate and/or repair aircraft electrical hardware or parts
MEA260	Use electrical test equipment
MEA289	Maintain basic light aircraft avionic systems and components
MEA290	Fit avionic modification sheet metal components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the Radio 1 rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the Radio 1 rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the Radio 1 additional rating for the B2 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00432 SAL016 Avionics – B2 Autopilot and flight control systems – Aeroplane – Rating 12

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA217 Inspect, test and troubleshoot fixed wing autopilot systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the autopilot and flight control systems aeroplane rating. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the autopilot and flight control systems aeroplane rating.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the autopilot and flight control systems aeroplane additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00433 SAL017 Avionics – B2 Autopilot and flight control systems – Helicopter - Rating 13

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA218 Inspect, test and troubleshoot rotary wing autopilot systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the autopilot and flight control systems helicopter rating. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the autopilot and flight control systems helicopter rating.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the autopilot and flight control systems helicopter additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00434 SAL018 Avionics – B2 Glass cockpit - Rating 14

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA278 Inspect, test and troubleshoot instrument display systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the glass cockpit rating. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the glass cockpit rating.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the glass cockpit additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00435 SAL019 Avionics – B2 Navigation systems – Rating 15

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA204	Remove and install basic aircraft instrument system components
MEA212	Inspect, test and troubleshoot basic aircraft instrument systems and components
MEA216	Inspect, test and troubleshoot instrument landing systems and components
MEA234	Inspect, test and troubleshoot aircraft global navigation systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the navigation systems rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the navigation systems rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the navigation systems additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00436 SAL020 Avionics – B2 Flight management systems – Rating 16

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA205	Remove and install advanced aircraft instrument system components
MEA213	Inspect, test and troubleshoot advanced aircraft instrument systems and components
MEA216	Inspect, test and troubleshoot instrument landing systems and components
MEA221	Inspect, test and troubleshoot aircraft secondary radar systems and components
MEA225	Inspect fixed wing aircraft automatic flight control systems and components
MEA230	Test and troubleshoot fixed wing aircraft automatic flight control systems and components
MEA233	Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components
MEA234	Inspect, test and troubleshoot aircraft global navigation systems and components
MEA280	Inspect, test and troubleshoot flight management systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the flight management systems rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the flight management systems rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the flight management systems additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00437 SAL021 Avionics – Inertial navigation systems - Rating 17

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA233 Inspect, test and troubleshoot aircraft inertial navigation and reference systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the inertial navigation systems rating. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the inertial navigation systems rating.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the inertial navigation systems additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00438 SAL022 Avionics – B2 Secondary radar - Rating 18

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the radio systems secondary radar rating covering Rad Alt, Transponder, DME, TCAS and ADSB. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the radio systems secondary radar rating.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the radio systems secondary radar (covering Rad Alt, Transponder, DME, TCAS and ADSB) additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00439 SAL023 Avionics – B2 Weather radar - Rating 19

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA220 Inspect, test and troubleshoot aircraft primary radar systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the weather radar rating. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the weather radar rating.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the weather radar additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00440 SAL024 Avionics – B2 Cockpit voice recorder - Rating 20

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206 Remove and install basic aircraft basic radio communication and navigation system components

MEA215 Inspect, test and troubleshoot advanced aircraft communications systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the Cockpit Voice Recorder (CVR) rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the CVR rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the radio systems CVR additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00441 SAL025 Avionics – B2 Flight data recorder systems - Rating 21

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA205	Remove and install advanced aircraft instrument system components
MEA213	Inspect, test and troubleshoot advanced aircraft instrument systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the Flight Data Recorder (FDR) systems rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the FDR systems rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the FDR systems additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00442 SAL026 Avionics – B2 High frequency radio systems - Rating 22

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA206	Remove and install basic aircraft basic radio communication and navigation system components
MEA214	Inspect, test and troubleshoot aircraft basic communications and radio navigation systems and components

Target Group

Holders of a CASA B2 small aircraft licence who wish to gain the High Frequency (HF) radio systems rating. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the HF radio systems rating.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the HF radio systems additional rating for the B2 small aircraft licence.

Custom Content Section

Not applicable.

MEASS00443 SAL027 B1.1 Removal of small aircraft limitation

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA142	Manage self in the aviation maintenance environment
MEA203	Remove and install advanced aircraft electrical system components
MEA208	Remove and install aircraft pressurisation control system components
MEA209	Remove and install oxygen systems and components
MEA219	Inspect, test and troubleshoot aircraft pressurisation control systems and components
MEA222	Inspect, test and troubleshoot aircraft oxygen systems and components
MEA223	Inspect aircraft electrical systems and components
MEA227	Test and troubleshoot aircraft electrical systems and components
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components
MEA303	Remove and install aircraft pneumatic system components
MEA305	Remove and install aircraft fixed wing flight control system components

MEA317	Remove and install pressurised aircraft structural and non-structural components
MEA318	Inspect aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components
MEA319	Inspect gas turbine engine systems and components
MEA320	Test and troubleshoot aircraft hydro-mechanical, mechanical, gaseous and landing gear systems and components
MEA321	Test and troubleshoot aircraft fixed wing flight control systems and components
MEA322	Test and troubleshoot gas turbine engine systems and components
MEA323	Perform advanced troubleshooting in aircraft mechanical maintenance
MEA325	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications
MEA328	Maintain and/or repair aircraft mechanical components or parts
MEA339	Inspect, repair and maintain aircraft structures
MEA343	Remove and install avionic system components

Target Group

Holders of a CASA B1.1 small aircraft licence who wish to remove the small aircraft limitation. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for removal of the B1.1 small aircraft licence limitation.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the removal of the small aircraft limitation from a B1.1 licence.

Custom Content Section

Not applicable.

MEASS00444 SAL028 B1.3 Removal of small aircraft limitation

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA142	Manage self in the aviation maintenance environment
MEA203	Remove and install advanced aircraft electrical system components
MEA211	Inspect, test and troubleshoot advanced aircraft electrical systems and components
MEA302	Remove and install aircraft hydro-mechanical and landing gear system components
MEA303	Remove and install aircraft pneumatic system components
MEA304	Remove and install non-pressurised aircraft structural and non-structural components
MEA308	Remove and install rotary wing rotor and flight control system components
MEA309	Inspect, test and troubleshoot aircraft hydro-mechanical and landing gear systems and components
MEA310	Inspect, test and troubleshoot aircraft pneumatic systems and components
MEA316	Inspect, test and troubleshoot rotary wing rotor and control systems and

	components
MEA319	Inspect gas turbine engine systems and components
MEA322	Test and troubleshoot gas turbine engine systems and components
MEA323	Perform advanced troubleshooting in aircraft mechanical maintenance
MEA325	Weigh aircraft and perform aircraft weight and balance calculations as a result of modifications
MEA328	Maintain and/or repair aircraft mechanical components or parts
MEA339	Inspect, repair and maintain aircraft structures
MEA343	Remove and install avionic system components

Target Group

Holders of a CASA B1.3 small aircraft licence who wish to remove the small aircraft limitation. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for removal of the B1.3 small aircraft licence limitation.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements for the removal of the small aircraft limitation from a B1.3 licence.

Custom Content Section

Not applicable.

MEASS00445 SAL029 B2 Removal of small aircraft limitation

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA142	Manage self in the aviation maintenance environment
MEA203	Remove and install advanced aircraft electrical system components
MEA205	Remove and install advanced aircraft instrument system components
MEA223	Inspect aircraft electrical systems and components
MEA224	Inspect aircraft instrument systems and components
MEA225	Inspect fixed wing aircraft automatic flight control systems and components
MEA226	Inspect aircraft electronic systems and components
MEA227	Test and troubleshoot aircraft electrical systems and components
MEA228	Test and troubleshoot aircraft instrument systems and components
MEA229	Test and troubleshoot aircraft radio frequency navigation and communications systems and components
MEA230	Test and troubleshoot fixed wing aircraft automatic flight control systems and components

MEA231	Inspect, test and troubleshoot rotary wing aircraft automatic flight control systems and components (alternative to MEA225 and MEA230)
MEA232	Test and troubleshoot aircraft pulse systems and components
MEA235	Perform advanced troubleshooting in aircraft avionic maintenance
MEA241	Perform aircraft weight and balance calculations as a result of modifications

Target Group

Holders of a CASA B2 small aircraft licence who wish to remove the small aircraft limitation. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for removal of the small aircraft limitation.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for removal of the small aircraft limitation from a B2 licence.

Custom Content Section

Not applicable.

MEASS00446 SAL030 Attainment of a B1.2 licence by holders of a B1.1 small aircraft licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA353 Maintain basic light aircraft engines and propellers

Target Group

Holders of a CASA B1.1 small aircraft licence who wish to also hold a B1.2 licence. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the grant of a B1.2 licence where a B1.1 small aircraft licence is already held.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the grant of a B1.2 licence to holders of B1.1 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00447 SAL031 Attainment of a B1.3 licence by holders of a B1.1 small aircraft licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA352 Maintain basic rotary wing aircraft systems

Target Group

Holders of a CASA B1.1 small aircraft licence who wish to also hold a B1.3 small aircraft licence. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the grant of a B1.3 small aircraft licence where a B1.1 small aircraft licence is already held.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the grant of a B1.3 small aircraft licence to holders of B1.1 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00448 SAL032 Attainment of a B1.4 licence by holders of a B1.1 small aircraft licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA352 Maintain basic rotary wing aircraft systems

MEA353 Maintain basic light aircraft engines and propellers

Target Group

Holders of a CASA B1.1 small aircraft licence who wish to also hold a B1.4 licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the grant of a B1.4 licence where a B1.1 small aircraft licence is already held.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the grant of a B1.4 licence to holders of B1.1 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00449 SAL033 Attainment of a B1.1 small aircraft licence by holders of a B1.2 licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and Diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306	Remove and install engines and engine system components
MEA307	Remove and install propeller systems and components
MEA314	Inspect, test and troubleshoot gas turbine engine systems and components
MEA315	Inspect, test and troubleshoot propeller systems and components

Target Group

Holders of a CASA B1.2 licence who wish to also hold a B1.1 small aircraft licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the grant of a B1.1 small aircraft licence where a B1.2 licence is already held.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the grant of a B1.1 small aircraft licence to holders of B1.2 licences.

Custom Content Section

Not applicable.

MEASS00450 SAL034 Attainment of a B1.3 small aircraft licence by holders of a B1.2 licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306	Remove and install engines and engine system components
MEA314	Inspect, test and troubleshoot gas turbine engine systems and components
MEA352	Maintain basic rotary wing aircraft systems

Target Group

Holders of a CASA B1.2 licence who wish to also hold a B1.3 small aircraft licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the grant of a B1.3 small aircraft licence where a B1.2 licence is already held.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA the grant of a B1.3 small aircraft licence to holders of B1.2 licences.

Custom Content Section

Not applicable.

MEASS00451 SAL035 Attainment of a B1.4 licence by holders of a B1.2 licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA352 Maintain basic rotary wing aircraft systems

Target Group

Holders of a CASA B1.2 licence who wish to also hold a B1.4 licence. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the grant of a B1.4 licence where a B1.2 licence is already held.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the grant of a B1.4 licence to holders of B1.2 licences.

Custom Content Section

Not applicable.

MEASS00452 SAL036 Attainment of a B1.1 small aircraft licence by holders of a B1.3 small aircraft licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA307	Remove and install propeller systems and components
MEA315	Inspect, test and troubleshoot propeller systems and components
MEA351	Maintain airframe systems of basic light fixed wing aircraft

Target Group

Holders of a CASA B1.3 small aircraft licence who wish to also hold a B1.1 small aircraft licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the grant of a B1.1 small aircraft licence where a B1.3 small aircraft licence is already held.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the grant of a B1.1 small aircraft licence to holders of B1.3 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00453 SAL037 Attainment of a B1.2 licence by holders of a B1.3 small aircraft licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA351 Maintain airframe systems of basic light fixed wing aircraft

MEA353 Maintain basic light aircraft engines and propellers

Target Group

Holders of a CASA B1.3 small aircraft licence who wish to also hold a B1.2 licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the grant of a B1.2 licence where a B1.3 small aircraft licence is already held.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the grant of a B1.2 licence to holders of B1.3 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00454 SAL038 Attainment of a B1.4 licence by holders of a B1.3 small aircraft licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA353 Maintain basic light aircraft engines and propellers

Target Group

Holders of a CASA B1.3 small aircraft licence who wish to also hold a B1.4 licence. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the grant of a B1.4 licence where a B1.3 small aircraft licence is already held.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the grant of a B1.4 licence to holders of B1.3 small aircraft licences.

Custom Content Section

Not applicable.

MEASS00455 SAL039 Attainment of a B1.1 small aircraft licence by holders of a B1.4 licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA306	Remove and install engines and engine system components
MEA307	Remove and install propeller systems and components
MEA314	Inspect, test and troubleshoot gas turbine engine systems and components
MEA315	Inspect, test and troubleshoot propeller systems and components
MEA351	Maintain airframe systems of basic light fixed wing aircraft

Target Group

Holders of a CASA B1.4 licence who wish to also hold a B1.1 small aircraft licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the grant of a B1.1 small aircraft licence where a B1.4 licence is already held.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the grant of a B1.1 small aircraft licence to holders of B1.4 licences.

Custom Content Section

Not applicable.

MEASS00456 SAL040 Attainment of a B1.2 licence by holders of a B1.4 licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate III and IV qualifications in Aeroskills that include this unit.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

MEA351 Maintain airframe systems of basic light fixed wing aircraft

Target Group

Holders of a CASA B1.4 licence who wish to also hold a B1.2 licence. This Skill Set covers the MEA Aeroskills Training Package unit of competency that must be attained for the grant of a B1.2 licence where a B1.4 licence is already held.

Suggested words for Statement of Attainment

This competency from the MEA Aeroskills Training Package meets the requirements of CASA for the grant of a B1.2 licence to holders of B1.4 licences.

Custom Content Section

Not applicable.

MEASS00457 SAL041 Attainment of a B1.3 small aircraft licence by holders of a B1.4 licence

Modification History

Release 1 - New Skill Set

Description

Not applicable.

Pathways Information

The MEA Aeroskills Training Package offers Certificate IV and diploma qualifications in Aeroskills that include these units.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

- | | |
|--------|--|
| MEA306 | Remove and install engines and engine system components |
| MEA314 | Inspect, test and troubleshoot gas turbine engine systems and components |

Target Group

Holders of a CASA B1.4 licence who wish to also hold a B1.3 small aircraft licence. This Skill Set covers the MEA Aeroskills Training Package units of competency that must be attained for the grant of a B1.3 small aircraft licence where a B1.4 licence is already held.

Suggested words for Statement of Attainment

These competencies from the MEA Aeroskills Training Package meet the requirements of CASA for the grant of a B1.3 small aircraft licence to holders of B1.4 licences.

Custom Content Section

Not applicable.

