



Australian Government

PMA08 Chemical, Hydrocarbons and Refining Training Package

Release: 4.1

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Modification History

Version	Release Date	Comments
4.1	23 October 2013	ISC Upgrades Inclusion of prerequisite units in Skill Sets: • PMASS00007 Incident response team member • PMASS00009 Off-shore incident response team member • imported units updated to latest release List of Imported Units • correction to training package origin details for MSS units Addition of industry sector and occupation data to taxonomy fields for qualifications: • PMA20113 • PMA30113 • PMA40113 Refer summary mapping
4	20 June 2013	Qualifications - endorsed changes Addition of new electives for metalliferous processing for: • PMA20113 • PMA30113 • PMA40113 No changes to packaging rules No change to outcomes for existing PMA sector pathways ISC upgrades • PMA50108 New release – addition of one new elective in Group A • PMA60108 New release New release of Skill Sets

Version	Release Date	Comments
		- PMASS00007 - PMASS00012 Imported units updated to current versions Refer to mapping for details
3.1	30 July 2012	- MEM elective unit code corrected in PMA20108, PMA30108 and PMA40108: MEM11011B - Removal of duplicate elective unit in PMA40108: MSAPMOPS400A
3	14 November 2011	Addition of: - two new PMA units of competency - one imported unit to be included as electives in: - PMA20108 - PMA30108 - PMA40108 Refer to mapping for details.
2.1	January 2011	Minor corrections to unit listings in qualifications re errors in unit version codes and prerequisites listed, as below: - Prerequisites listed corrected in qualifications for: MEM07034, PMAOPS222B, PMAOPS301B, PMAOPS402A, PMASUP445A. - Version codes corrected in qualifications for MSAPMOHS210B, MSAPMSUP200A, PMAOMIR210B, MSAPMSUP300A, MSASUP441C. Non-existent unit removed from unit list in PMA60108 (MSACMT672A). Error in PC3.1 in PMAOHS311A corrected to include "control" (control/extinguishing as in PC1.3): <i>3.1 Initiate control/extinguishing</i>

Version	Release Date	Comments
		<i>responses</i>
2	October 2010	Six new units of competency included as electives in PMA20108, PMA30108 and PMA40108. ISC updates to all qualifications – superseded imported units replaced and all qualifications adjusted for flexibility rules.
1.1	July 2010	ISC updates to PMA20108 to comply with flexibility rules – one unit added to importation allowance.
1	27 August 2008	Primary release, replacing PMA02

PMA08 Version 2

New PMA units of competency

PMAOPS233A	Monitor wells and gathering systems	New to PMA08v2
PMAOPS234A	Monitor and operate low pressure compressors	New to PMA08v2
PMAOPS241A	Operate Joule-Thomson effect device	New to PMA08v2
PMAOPS280B	Interpret process plant schematics	Equivalent outcome. Clarified wording
PMAOPS333A	Operate wells and gathering systems	New to PMA08v2
PMAOPS433A	Manage wells and gathering systems	New to PMA08v2
PMAOPS434A	Commission wells and gathering systems	New to PMA08v2

Revised imported units for confined space entry

MSAPMPER200C	Work in accordance with an issued permit	Equivalent outcome. Updated to reflect changes in MSAPER205C

MSAPMPER205C	Enter confined space	Equivalent outcome. Updated to reflect changes to Australian Standard
MSAPMPER300C	Issue work permits	Equivalent outcome. Updated to reflect changes in MSAPER205C

Preliminary Information

Important Note to Users

Training Packages are not static documents; they are amended periodically to reflect the latest industry practices and are version controlled. It is essential that the latest version is always used.

Check the version number before commencing training or assessment

This Training Package is Version 4.1 - check whether this is the latest version by going to the training.gov.au and locating information about the Training Package. Alternatively, contact Manufacturing Industry Skills Council at <http://www.mskills.com.au> to confirm the latest version number.

Explanation of version number conventions

The primary release Training Package is Version 1. When changes are made to a Training Package, sometimes the version number is changed and sometimes it is not, depending on the extent of the change. When a Training Package is reviewed it is considered to be a new Training Package for the purposes of version control, and is Version 1. Do not confuse the version number with the Training Packages national code (which remains the same during its period of endorsement).

Summary of AQF Qualifications in this Training Package

Qualification Code	Title
PMA20113	Certificate II in Process Plant Operations
PMA30113	Certificate III in Process Plant Operations
PMA40113	Certificate IV in Process Plant Technology
PMA50108	Diploma of Process Plant Technology
PMA60108	Advanced Diploma of Process Plant Technology
PMA70108	Vocational Graduate Certificate in Surface Coating Technology

PMA08v4 - Summary Mapping

PMA08v4.1

Skill Sets - ISC Upgrade

New releases - existing Skill Sets

PMA08v4.1	Comments
PMAS00007 Incident response team member	Release 3 - inclusion of prerequisite units in Skill Set Requirements
PMAS00009 Off-shore incident response team member	Release 2 - inclusion of prerequisite units in Skill Set Requirements

Qualifications - ISC upgrade

PMA20113 Certificate II in Process Plant Operations	Release 2 - Addition of industry sector and occupation data to taxonomy fields.
PMA30113 Certificate III in Process Plant Operations	Release 2 - Addition of industry sector and occupation data to taxonomy fields.
PMA40113 Certificate IV in Process Plant Technology	Release 2 - Addition of industry sector and occupation data to taxonomy fields.

Imported units - updated to latest release

NWP357B Monitor, operate and control reverse osmosis and nano-filtration processes (Release 2)

PSPGOV308B Work effectively with diversity (Release 3)

PSPMNGT604B Manage change (Release 3)

PSPMNGT605B Manage diversity (Release 3)

UEPOPS340B Operate and monitor a steam turbine (Release 2)

PMA08v4**Qualifications – endorsed changes****Notes:**

- Addition of new electives for metalliferous processing
- No changes to packaging rules
- No change to outcomes for existing PMA sector pathways

PMA08v4 Qualifications	PMA08v3 qualifications	Comments
PMA20113 Certificate II in Process Plant Operations	PMA20108 Certificate II in Process Plant Operations	Addition of new metalliferous processing electives. Existing pathways remain equivalent.
PMA30113 Certificate III in Process Plant Operations	PMA30108 Certificate III in Process Plant Operations	Addition of new metalliferous processing electives. Existing pathways remain equivalent.
PMA40113 Certificate IV in Process Plant Technology	PMA40108 Certificate IV in Process Plant Technology	Addition of new metalliferous processing electives. Existing pathways remain equivalent.

Qualifications – ISC upgrades

PMA08v4 Qualifications	PMA08v3 qualifications	Comments
PMA50108 Diploma of Process Plant Technology	PMA50108 Diploma of Process Plant Technology	Release 2 – addition of one new elective in Group A. Imported units updated to current versions
PMA60108 Advanced Diploma of Process Plant Technology	PMA60108 Advanced Diploma of Process Plant Technology	Release 2 - imported units updated to current versions

New units of competency

PMA08v4	Prerequisites	Packaging
PMAOPS242A Moor ships for transfer of bulk processed particulates or fluids	Nil	PMA20113 (Group A) PMA30113 (Group C) PMA40113 (Group C)
PMAOPS246A Operate separation equipment	Nil	PMA20113 (Group A) PMA30113 (Group C) PMA40113 (Group C)
PMAOPS247A Operate powered separation equipment	Nil	PMA20113 (Group A) PMA30113 (Group C) PMA40113 (Group C)
PMAOPS260A Conduct screening operations	Nil	PMA20113 (Group A) PMA30113 (Group C) PMA40113 (Group C)
PMAOPS261A Operate bulk solids loading equipment	Nil	PMA20113 (Group A) PMA30113 (Group C) PMA40113 (Group C)
PMAOPS262A Operate digestion equipment	Nil	PMA20113 (Group A) PMA30113 (Group C) PMA40113 (Group C)
PMAOPS263A Operate leaching equipment	Nil	PMA20113 (Group A) PMA30113 (Group C) PMA40113 (Group C)
PMAOPS264A Operate solvent extraction equipment	Nil	PMA20113 (Group A) PMA30113 (Group C) PMA40113 (Group C)
PMAOPS265A Operate magnetic/ electrical separation equipment	Nil	PMA20113 (Group A) PMA30113 (Group C)

		PMA40113 (Group C)
PMAOPS360A Operate a metalliferous kiln/furnace	Nil	PMA30113 (Group A) PMA40113 (Group C)
PMAOPS361A Operate a smelting furnace	Nil	PMA30113 (Group A) PMA40113 (Group C)
PMAOPS362A Operate a blast furnace	Nil	PMA30113 (Group A) PMA40113 (Group C)
PMAOPS364A Operate an electrochemical process	Nil	PMA30113 (Group A) PMA40113 (Group C)
PMAOPS365A Operate pelletising equipment	Nil	PMA30113 (Group A) PMA40113 (Group C)
PMAOPS366A Operate sintering equipment	Nil	PMA30113 (Group A) PMA40113 (Group C)
PMAOPS460A Monitor and operate tailings management facilities	Nil	PMA40113 (Group A)
PMAOPS560A Plan and design tailings management facilities	Nil	PMA50108 (Group A)
PMAOMIR305A Operate panel during an emergency	PMAOPS305B Operate process control systems	PMA30113 (Group A) PMA40113 (Group B)

New releases – existing PMA units

PMA08v4	Prerequisites	Comment
PMAOPS208B Operate chemical separation equipment	Nil	New release – editorial changes. Outcomes equivalent.
PMAOPS210B Operate particulates handling equipment	Nil	New release – editorial changes. Outcomes equivalent.

PMAOPS232B Produce product by filtration	Nil	New release – editorial changes. Outcomes equivalent.
PMAOPS300B Operate a production unit	Nil	New release – editorial changes. Outcomes equivalent.
PMAOPS309B Operate particulates handling/storage equipment	Nil	New release – editorial changes. Outcomes equivalent.
PMAOPS312B Undertake ship loading/unloading operations	Nil	New release – editorial changes. Outcomes equivalent.

New releases - existing Skill sets

PMASS00007 Incident response team member	Release 2 - imported units updated to current versions
PMASS00012 Workplace assessor	Release 2 - imported units updated to current versions

PMA08v4 – additional imported units

PMA08v4	Prerequisites	Comment
MEM04001B Operate melting furnaces	Nil	New to PMA
PMC552002C Operate equipment to blend/mix materials	Nil	New to PMA
PMC552003C Operate grinding equipment	Nil	New to PMA
PMC552008B Operate crushing equipment	Nil	New to PMA

PMC562070B Move materials	Nil	New to PMA

PMA08v4 – imported units updated to current versions

PMA08v4		PMA08v3		
Code	Title	Code	Title	Relationship
FDFPH1001A	Follow work procedures to maintain Good Manufacturing Practice	FDFPHGMP1A	Follow work procedures to maintain Good Manufacturing Practice	Unit replaces earlier version.
FDFPH2001A	Apply Good Manufacturing Practice procedures	FDFPHGMP2B	Implement Good Manufacturing Practice procedures	Retitled unit to 'Apply' Good Manufacturing Practice procedures in keeping with AQF 2 expectations. Unit replaces earlier version.
MSS403011A	Facilitate implementation of competitive systems and practices	MSACMC411A	Lead a competitive manufacturing team	New unit - Not equivalent
MSS403013A	Lead team culture improvement	MSACMC413A	Lead team culture improvement	New unit - Equivalent
MSS405010A	Manage relationships with non-customer external organisations	MSACMC610A	Manage relationships with non-customer external organisations	New unit - Equivalent
MSS405011A	Manage people relationships	MSACMC611A	Manage people relationships	New unit- Not equivalent

MSS405012A	Manage workplace learning	MSACMC612A	Manage workplace learning	New unit - Not equivalent
MSS402002A	Sustain process improvements	MSACMS201A	Sustain process improvements	New unit - Not equivalent
MSS403002A	Ensure process improvements are sustained	MSACMS401A	Ensure process improvements are sustained	New unit - Not equivalent
MSS402030A	Apply cost factors to work practices	MSACMT230A	Apply cost factors to work practices	New unit - Equivalent
MSS402031A	Interpret product costs in terms of customer requirements	MSACMT231A	Interpret product costs in terms of customer requirements	New unit - Equivalent
MSS402040A	Apply 5S procedures	MSACMT240A	Apply 5S procedures in a manufacturing environment	New unit - Equivalent
MSS402050A	Monitor process capability	MSACMT250A	Monitor process capability	New unit - Equivalent
MSS402051A	Apply quality standards	MSACMT251A	Apply quality standards	New unit - Equivalent
MSS402060A	Use planning software systems in operations	MSACMT260A	Use planning software systems in manufacturing	New unit - Not equivalent
MSS402080A	Undertake root cause analysis	MSACMT280A	Undertake root cause analysis	New unit - Equivalent
MSS402081A	Contribute to the application of a proactive maintenance strategy	MSACMT281A	Contribute to the application of a proactive maintenance strategy	New unit - Equivalent
MSS403030A	Improve cost factors in work practices	MSACMT430A	Improve cost factors in work practices	New unit - Equivalent

MSS403040A	Facilitate and improve implementation of 5S	MSACMT440A	Lead 5S in a manufacturing environment	New unit - Not equivalent
MSS403041A	Facilitate breakthrough improvements	MSACMT441A	Facilitate continuous improvement in manufacturing	New unit - Not equivalent
MSS404050A	Undertake process capability improvements	MSACMT450A	Undertake process capability improvements	New unit - Equivalent New prerequisite
MSS403051A	Mistake proof an operational process	MSACMT451A	Mistake proof a production process	New unit - Equivalent
MSS404052A	Apply statistics to operational processes	MSACMT452A	Apply statistics to processes in manufacturing	New unit - Equivalent
MSS404060A	Facilitate the use of planning software systems in a work area or team	MSACMT460A	Facilitate the use of planning software systems in manufacturing	New unit - Not equivalent
MSS404081A	Undertake proactive maintenance analyses	MSACMT481A	Undertake proactive maintenance analyses	New unit - Equivalent
MSS404082A	Assist in implementing a proactive maintenance strategy	MSACMT482A	Assist in implementing a proactive maintenance strategy	New unit - Equivalent
MSS405030A	Optimise cost of a product or service	MSACMT630A	Optimise cost of product	New unit - Not equivalent
MSS405031A	Undertake value analysis of product or process costs in terms of customer	MSACMT631A	Undertake value analysis of product costs in terms of customer requirements	New unit - Not equivalent

	requirements			
MSS405040A	Manage 5S system in an organisation	MSACMT640A	Manage 5S system in a manufacturing environment	New unit - Equivalent
MSS405041A	Implement improvement systems in an organisation	MSACMT641A	Implement a continuous improvement system	New unit - Not equivalent
MSS405050A	Determine and improve process capability	MSACMT650A	Determine and improve process capability	New unit - Equivalent New prerequisite
MSS405060A	Develop the application of enterprise control systems in an organisation	MSACMT660A	Develop the application of enterprise systems in manufacturing	New unit - Equivalent
MSS405061A	Determine and establish information collection requirements and processes	MSACMT661A	Determine and establish information collection requirements and processes	New unit - Equivalent
MSS405070A	Develop and manage sustainable energy practices	MSACMT670A	Develop and manage sustainable energy practices	New unit - Equivalent
MSS405081A	Develop a proactive maintenance strategy	MSACMT681A	Develop a proactive maintenance strategy	New unit - Equivalent
PMAOHS213B	Undertake fire control and emergency rescue	PMAOHS213A	Undertake fire control and emergency rescue	Equivalent
MSL973001A	Perform basic tests	PMLTEST300B	Perform basic tests	Equivalent
TAEASS301B	Contribute to assessment	TAEASS301A	Contribute to assessment	Equivalent

TAEASS401B	Plan assessment activities and processes	TAEASS401A	Plan assessment activities and processes	Equivalent
TAEASS402B	Assess competence	TAEASS402A	Assess competence	Equivalent
TAEASS403B	Participate in assessment validation	TAEASS403A	Participate in assessment validation	Equivalent
TLID2010A	Operate a forklift	TLID1007C	Operate a forklift	Equivalent
UEPOPS319B	Operate and monitor gas production plant	UEPOPS319A	Operate and Monitor Gas Production Plant	Equivalent
UEPOPS340B	Operate and monitor a steam turbine	UEPOPS340A	Operate and Monitor a Steam Turbine	Equivalent

Mapping to Previous Training Package

PMA08v3 Summary Mapping

New PMA units of competency

PMASUP244A	Prepare and isolate plant	New to PMA08v3
PMASUP444A	Plan plant preparation and isolation	New to PMA08v3

New imported unit

NWP357B	Monitor, operate and control reverse osmosis and nano-filtration processes	New to PMA08v3

Mapping of changes to qualifications – PMA08v3 to PMA08v2

PMA08 V3	PMA08 V2	

Code	Title	Code	Title	Relationship
PMA20108	Certificate II in Process Plant Operations	PMA20108	Certificate II in Process Plant Operations	Equivalent – additional elective
PMA30108	Certificate III in Process Plant Operations	PMA30108	Certificate III in Process Plant Operations	Equivalent – two additional electives
PMA40108	Certificate IV in Process Plant Technology	PMA40108	Certificate IV in Process Plant Technology	Equivalent – three additional electives

PMA08v2 to PMA08v1

PMA08 V2		PMA08 V1		
Code	Title	Code	Title	Relationship
PMA20108	Certificate II in Process Plant Operations	PMA20108	Certificate II in Process Plant Operations	Equivalent – some additional electives, adjusted for flexibility and sustainability, imported units updated
PMA30108	Certificate III in Process Plant Operations	PMA30108	Certificate III in Process Plant Operations	Equivalent – some additional electives, adjusted for flexibility and sustainability, imported units updated
PMA40108	Certificate IV in Process Plant Technology	PMA40108	Certificate IV in Process Plant Technology	Equivalent – some additional electives, adjusted for flexibility and sustainability, imported units updated
PMA50108	Diploma of Process Plant Technology	PMA50108	Diploma of Process Plant Technology	Equivalent – adjusted for flexibility and sustainability, imported units updated
PMA60108	Advanced	PMA60108	Advanced	Equivalent – adjusted for

	Diploma of Process Plant Technology		Diploma of Process Plant Technology	flexibility and sustainability, imported units updated
PMA70108	Vocational Graduate Certificate in Surface Coating Technology	PMA70108	Vocational Graduate Certificate in Surface Coating Technology	Equivalent – adjusted for flexibility

PMA08 to PMA02

PMA08	PMA02	
Qualification code and title	Qualification code and title	Relationship
	PMA10102 Certificate I in Process Plant Skills	Not carried forward. The rationalised MSA10207 Certificate I in Process Manufacturing is an equivalent qualification.
	PMA10202 Certificate I in Process Support	Not carried forward. Replaced by MSA10207. Revised for use across process manufacturing and relocated to MSA07. MSA10207 is an equivalent qualification.
PMA20108 Certificate II in Process Plant Operations	PMA20102 Certificate II in Process Plant Operations	Equivalent
	Certificate II in Process Support PMA20202	Not carried forward. Replaced by MSA20107. Revised for use across process manufacturing. MSA20107 is an equivalent qualification.
PMA30108 Certificate III in Process Plant Operations	PMA30102 Certificate III in Process Plant Operations	Equivalent

	Certificate III in Process Support PMA30202	Not carried forward. Replaced by MSA30107. Revised for use across process manufacturing. MSA30107 is an equivalent qualification.
PMA40108 Certificate IV in Process Plant Technology	PMA40102 Certificate IV in Process Plant Technology	Equivalent
PMA50108 Diploma of Process Plant Technology	PMA50102 Diploma of Process Plant Technology	Equivalent, but now does not assume prior completion of PMA40102
PMA60108 Advanced Diploma of Process Plant Technology	PMA60102 Advanced Diploma of Process Plant Technology	Equivalent
PMA70108 Vocational Graduate Certificate in Surface Coating Technology		New qualification.

Mapping of Units of Competency

PMA08v2 to PMA08v1

PMA08v2			PMA08v1		
Unit Code	Title	Prerequisites	Unit Code	Title	Comment
			PUAFIR306A	Render hazardous materials safe	Not carried forward
			PUASAR003A	Undertake technical rescue	Not carried forward
			PUASAR004A	Undertake vertical rescue	Not carried forward
			PUASAR005	Undertake	Not

PMA08v2			PMA08v1		
			A	Confined Space Rescue	carried forward
FDFPHGMP 1A	Follow work procedures to maintain Good Manufacturing Practice		FDFPHGMP 1A	Follow work procedures to maintain Good Manufacturing Practice	No change
FDFPHMG MP2B	Apply Good Manufacturing Practice procedures		FDFPHGMP 2B	Implement Good Manufacturing Practice procedures	No change
FDFPHMG MP3A	Monitor and maintain Good Manufacturing Practice procedures		FDFPHGMP 3A	Monitor the implementation of Good Manufacturing Practice procedures	No change
MEM05012 C	Perform routine manual metal arc welding		MEM05012 C	Perform routine manual metal arc welding	No change
MEM07033 B	Operate and monitor basic boiler		MEM07033 B	Operate and monitor basic boiler	No change
MEM07034 A	Operate and monitor intermediate class boiler	MEM07033 B	MEM07034 A	Operate and monitor intermediate class boiler	No change
MEM09002 B	Interpret technical drawing		MEM09002 B	Interpret technical drawing	No change
MEM09003 B	Prepare basic engineering drawing	MEM09002 B	MEM09003 B	Prepare basic engineering drawing	No change
MEM11011 B	Undertake manual handling		MEM11011 B	Undertake manual handling	No change
MEM16005 A	Operate as a team member to conduct		MEM16005 A	Operate as a team member to conduct	No change

PMA08v2			PMA08v1		
	manufacturing, engineering or related activities			manufacturing, engineering or related activities	
MEM18011 C	Shutdown and isolate machines/equipment		MEM18011 C	Shutdown and isolate machines/equipment	No change
MSACMC41 1A	Lead a competitive manufacturing team		MSACMC41 1A	Lead a competitive manufacturing team	No change
MSACMC41 3A	Lead team culture improvement		MSACMC41 3A	Lead team culture improvement	No change
MSACMC61 0A	Manage relationships with non-customer external organisations		MSACMC61 0A	Manage relationships with non-customer external organisations	No change
MSACMC61 1A	Manage people relationships		MSACMC61 1A	Manage people relationships	No change
MSACMC61 2A	Manage workplace learning		MSACMC61 2A	Manage workplace learning	No change
MSACMS20 1A	Sustain process improvements		MSACMS20 1A	Sustain process improvements	No change
MSACMS40 1A	Ensure process improvements are sustained		MSACMS40 1A	Ensure process improvements are sustained	No change
MSACMT23 0A	Apply cost factors to work practices		MSACMT23 0A	Apply cost factors to work practices	No change
MSACMT23 1A	Interpret product costs in terms of customer requirements		MSACMT23 1A	Interpret product costs in terms of customer requirements	No change
MSACMT24 0A	Apply 5S procedures in a		MSACMT24 0A	Apply 5S procedures in a	No change

PMA08v2			PMA08v1		
	manufacturing environment			manufacturing environment	
MSACMT25 0A	Monitor process capability		MSACMT25 0A	Monitor process capability	No change
MSACMT25 1A	Apply quality standards		MSACMT25 1A	Apply quality standards	No change
MSACMT26 0A	Use planning software systems in manufacturing		MSACMT26 0A	Use planning software systems in manufacturing	No change
MSACMT27 0A	Use sustainable energy practices		MSACMT27 0A	Use sustainable energy practices	No change
MSACMT27 1A	Use sustainable environmental practices		MSACMT27 1A	Use sustainable environmental practices	No change
MSACMT28 0A	Undertake root cause analysis		MSACMT28 0A	Undertake root cause analysis	No change
MSACMT28 1A	Contribute to the application of a proactive maintenance strategy		MSACMT28 1A	Contribute to the application of a proactive maintenance strategy	No change
MSACMT43 0A	Improve cost factors in work practices		MSACMT43 0A	Improve cost factors in work practices	No change
MSACMT44 0A	Lead 5S in a manufacturing environment		MSACMT44 0A	Lead 5S in a manufacturing environment	No change
MSACMT44 1A	Facilitate continuous improvement in manufacturing		MSACMT44 1A	Facilitate continuous improvement in manufacturing	No change
MSACMT45 0A	Undertake process capability improvements		MSACMT45 0A	Undertake process capability improvements	No change
MSACMT45	Mistake proof a		MSACMT45	Mistake proof a	No

PMA08v2			PMA08v1		
1A	production process		1A	production process	change
MSACMT45 2A	Apply statistics to processes in manufacturing		MSACMT45 2A	Apply statistics to processes in manufacturing	No change
MSACMT46 0A	Facilitate the use of planning software systems in manufacturing		MSACMT46 0A	Facilitate the use of planning software systems in manufacturing	No change
MSACMT48 1A	Undertake proactive maintenance analyses		MSACMT48 1A	Undertake proactive maintenance analyses	No change
MSACMT48 2A	Assist in implementing a proactive maintenance strategy		MSACMT48 2A	Assist in implementing a proactive maintenance strategy	No change
MSACMT63 0A	Optimise cost of product		MSACMT63 0A	Optimise cost of product	No change
MSACMT64 0A	Manage 5S system in a manufacturing environment		MSACMT64 0A	Manage 5S system in a manufacturing environment	No change
MSACMT64 1A	Implement a continuous improvement system		MSACMT64 1A	Implement a continuous improvement system	No change
MSACMT65 0A	Determine and improve process capability		MSACMT65 0A	Determine and improve process capability	No change
MSACMT66 0A	Develop the application of enterprise systems in manufacturing		MSACMT66 0A	Develop the application of enterprise systems in manufacturing	No change
MSACMT66 1A	Determine and establish information collection		MSACMT66 1A	Determine and establish information collection	No change

PMA08v2			PMA08v1		
	requirements and processes			requirements and processes	
MSACMT670A	Develop and manage sustainable energy practices		MSACMT670A	Develop and manage sustainable energy practices	No change
MSACMT671A	Develop and manage sustainable environmental practices		MSACMT671A	Develop and manage sustainable environmental practices	No change
MSACMT672A	Develop workplace policy and procedures for sustainability		MSACMT672A	Develop workplace policy and procedures for sustainability	No change
MSACMT681A	Develop a proactive maintenance strategy		MSACMT681A	Develop a proactive maintenance strategy	No change
MSAENV272B	Participate in environmentally sustainable work practices		MSAENV272A	Participate in environmentally sustainable work practices	Wording clarified - equivalent
MSAENV472B	Implement and monitor environmentally sustainable work practices		MSAENV472A	Implement and monitor environmentally sustainable work practices	Wording clarified - equivalent
MSAENV672B	Develop workplace policy and procedures for environmental sustainability		MSAENV672A	Develop workplace policy and procedures for sustainability	Title corrected, wording clarified - equivalent
MSAPMOH	Follow OHS		MSAPMOH	Follow OHS	No

PMA08v2			PMA08v1		
S100A	procedures		S100A	procedures	change
MSAPMOH S110A	Follow emergency response procedures		MSAPMOH S110A	Follow emergency response procedures	No change
MSAPMOH S200A	Work safely		MSAPMOH S200A	Work safely	No change
MSAPMOH S205A	Control minor incidents		MSAPMOH S205A	Control minor incidents	No change
MSAPMOH S210B	Undertake first response to non-fire incidents		MSAPMOH S210B	Undertake first response to non-fire incidents	No change
MSAPMOH S212A	Undertake first response to fire incidents		MSAPMOH S212A	Undertake first response to fire incidents	No change
MSAPMOH S216A	Operate breathing apparatus		MSAPMOH S216A	Operate breathing apparatus	No change
MSAPMOH S217A	Gas test atmospheres		MSAPMOH S217A	Gas test atmospheres	No change
MSAPMOH S220A	Provide initial first aid response		MSAPMOH S220A	Provide initial first aid response	No change
MSAPMOH S300A	Facilitate the implementation of OHS for a work group		MSAPMOH S300A	Facilitate the implementation of OHS for a work group	No change
MSAPMOH S400A	Contribute to workplace OHS management system		MSAPMOH S400A	Contribute to workplace OHS management system	No change
MSAPMOH S401A	Assess risk		MSAPMOH S401A	Assess risk	No change
MSAPMOH S503A	Maintain the workplace OHS management system		MSAPMOH S503A	Maintain the workplace OHS management system	No change

PMA08v2			PMA08v1		
MSAPMOH S510A	Manage risk		MSAPMOH S510A	Manage risk	No change
MSAPMOH S601A	Establish workplace OHS management system		MSAPMOH S601A	Establish workplace OHS management system	No change
MSAPMOPS 100A	Use equipment		MSAPMOPS 100A	Use equipment	No change
MSAPMOPS 102A	Perform tasks to support production		MSAPMOPS 102A	Perform tasks to support production	No change
MSAPMOPS 200A	Operate equipment		MSAPMOPS 200A	Operate equipment	No change
MSAPMOPS 212A	Use enterprise computers or data systems		MSAPMOPS 212A	Use enterprise computers or data systems	No change
MSAPMOPS 400A	Optimise process/plant area		MSAPMOPS 400A	Optimise process/plant area	No change
MSAPMOPS 401A	Trial new process product		MSAPMOPS 401A	Trial new process product	No change
MSAPMOPS 404A	Co-ordinate maintenance		MSAPMOPS 404A	Co-ordinate maintenance	No change
MSAPMOPS 405A	Identify problems in fluid power system		MSAPMOPS 405A	Identify problems in fluid power system	No change
MSAPMOPS 406A	Identify problems in electronic control systems		MSAPMOPS 406A	Identify problems in electronic control systems	No change
MSAPMPER 200C	Work in accordance with an issued permit		MSAPMPER 200B	Work in accordance with an issued permit	Updated -equivalent
MSAPMPER 201A	Monitor and control work permits		MSAPMPER 201A	Monitor and control work permits	No change
MSAPMPER	Observe permit		MSAPMPER	Observe permit	No

PMA08v2			PMA08v1		
202A	work		202A	work	change
MSAPMPER 205C	Enter confined space		MSAPMPER 205B	Enter confined space	Updated - equivalent
MSAPMPER 300C	Issue work permits	RIIRIS201A	MSAPMPER 300B	Issue work permits	Updated - equivalent
MSAPMPER 400A	Coordinate permit process		MSAPMPER 400A	Coordinate permit process	No change
MSAPMSUP 100A	Apply workplace procedures		MSAPMSUP 100A	Apply workplace procedures	No change
MSAPMSUP 101A	Clean workplace or equipment		MSAPMSUP 101A	Clean workplace or equipment	No change
MSAPMSUP 102A	Communicate in the workplace		MSAPMSUP 102A	Communicate in the workplace	No change
MSAPMSUP 106A	Work in a team		MSAPMSUP 106A	Work in a team	No change
MSAPMSUP 172A	Identify and minimise environmental hazards		MSAPMSUP 172A	Identify and minimise environmental hazards	No change
MSAPMSUP 200A	Achieve work outcomes		MSAPMSUP 200A	Achieve work outcomes	No change
MSAPMSUP 201A	Receive or despatch goods		MSAPMSUP 201A	Receive or despatch goods	No change
MSAPMSUP 204A	Pack products or materials		MSAPMSUP 204A	Pack products or materials	No change
MSAPMSUP 205A	Transfer loads		MSAPMSUP 205A	Transfer loads	No change
MSAPMSUP 210A	Process and record information		MSAPMSUP 210A	Process and record information	No change

PMA08v2			PMA08v1		
MSAPMSUP 240A	Undertake minor maintenance		MSAPMSUP 240A	Undertake minor maintenance	No change
MSAPMSUP 280A	Manage conflict at work		MSAPMSUP 280A	Manage conflict at work	No change
MSAPMSUP 291A	Participate in continuous improvement		MSAPMSUP 291A	Participate in continuous improvement	No change
MSAPMSUP 292A	Sample and test materials and product		MSAPMSUP 292A	Sample and test materials and product	No change
MSAPMSUP 300A	Identify and implement opportunities to maximise production efficiencies		MSAPMSUP 300A	Identify and implement opportunities to maximise production efficiencies	No change
MSAPMSUP 301A	Apply HACCP to the workplace		MSAPMSUP 301A	Apply HACCP to the workplace	No change
MSAPMSUP 303A	Identify equipment faults		MSAPMSUP 303A	Identify equipment faults	No change
MSAPMSUP 309A	Maintain and organise workplace records		MSAPMSUP 309A	Maintain and organise workplace records	No change
MSAPMSUP 310A	Contribute to development of plant documentation		MSAPMSUP 310A	Contribute to development of plant documentation	No change
MSAPMSUP 330A	Develop and adjust a production schedule		MSAPMSUP 330A	Develop and adjust a production schedule	No change
MSAPMSUP 382A	Provide coaching/mentoring in the workplace		MSAPMSUP 382A	Provide coaching/mentoring in the workplace	No change
MSAPMSUP	Facilitate a team		MSAPMSUP	Facilitate a team	No

PMA08v2			PMA08v1		
383A			383A		change
MSAPMSUP 390A	Use structured problem solving tools		MSAPMSUP 390A	Use structured problem solving tools	No change
MSAPMSUP 400A	Develop and monitor quality systems		MSAPMSUP 400A	Develop and monitor quality systems	No change
MSL936001 A	Maintain quality system and continuous improvement processes within work/functional area		PMLQUAL6 00B	Maintain quality system and continuous improvement processes within work/functional area	Updated - equivale nt
MSL952001 A	Collect Routine Site Samples		PMLSAMP2 00A	Collect Routine Site Samples	Updated - equivale nt
MSL954001 A	Obtain representative samples in accordance with a sampling plan		PMLSAMP4 00B	Obtain representative samples in accordance with a sampling plan	Updated - equivale nt
MSL973001 A	Perform basic tests		PMLTEST30 0B	Perform basic tests	Updated - equivale nt
MSL976003 A	Evaluate and select appropriate test methods and procedures		PMLTEST60 3A	Evaluate and select appropriate test methods and procedures	Updated - equivale nt
MSL977001 A	Contribute to the development of products and applications	MSL976003 A	PMLTEST70 0B	Contribute to the development of products and applications	Updated - equivale nt
MSL977002 A	Troubleshoot equipment and production	MSL976003 A	PMLTEST70 1B	Troubleshoot equipment and production	Updated - equivale

PMA08v2			PMA08v1		
	processes			processes	nt
MSL977004 A	Develop or adapt analyses and procedures	MSL976003 A	PMLTEST70 3B	Develop or adapt analyses and procedures	Updated - equivalent
PMAOHS21 1B	Prepare equipment for emergency response		PMAOHS21 1B	Prepare equipment for emergency response	No change
PMAOHS21 3B	Undertake fire control and emergency rescue		PMAOHS21 3B	Undertake fire control and emergency rescue	No change
PMAOHS21 4B	Undertake helicopter safety and escape		PMAOHS21 4B	Undertake helicopter safety and escape	No change
PMAOHS21 5B	Apply offshore facility abandonment and sea survival procedures and practices		PMAOHS21 5B	Apply offshore facility abandonment and sea survival procedures and practices	No change
PMAOHS22 1B	Maintain first aid supplies and records		PMAOHS22 1B	Maintain first aid supplies and records	No change
PMAOHS31 0B	Investigate incidents		PMAOHS31 0B	Investigate incidents	No change
PMAOHS31 1B	Lead emergency teams		PMAOHS31 1B	Lead emergency teams	No change
PMAOHS31 2B	Command the operation of survival craft	MSAPMOH S220A	PMAOHS31 2B	Command the operation of survival craft	No change
PMAOHS32 0C	Provide advanced first aid response	MSAPMOH S220A	PMAOHS32 0C	Provide advanced first aid response	No change
PMAOHS32 1B	Provide First Aid response in remote and/or isolated area	MSAPMOH S220A	PMAOHS32 1B	Provide First Aid response in remote and/or isolated area	No change

PMA08v2			PMA08v1		
PMAOHS420B	Develop First Aid procedures and manage resources		PMAOHS420B	Develop First aid procedures and manage resources	No change
PMAOHS502B	Contribute to safety case		PMAOHS502B	Contribute to safety case	No change
PMAOHS511A	Manage emergency incidents	PMAOMIR320B	PMAOHS511A	Manage emergency incidents	No change
PMAOMIR210B	Control evacuation to muster point		PMAOMIR210B	Control evacuation to muster point	No change
PMAOMIR301B	Undertake initial rescue	MSAPMOH S216A MSAPMPER 205C MSAPMOH S220A MSAPMOH S217A MSAPMPER 200C	PMAOMIR301B	Undertake initial rescue	No change
PMAOMIR302B	Respond to a helideck incident		PMAOMIR302B	Respond to a helideck incident	No change
PMAOMIR317B	Facilitate search and rescue operations		PMAOMIR317B	Facilitate search and rescue operations	No change
PMAOMIR320B	Manage incident response information		PMAOMIR320B	Manage incident response information	No change
PMAOMIR321B	Manage communication systems during an incident		PMAOMIR321B	Manage communication systems during an incident	No change
PMAOMIR346B	Assess and secure an incident site		PMAOMIR346B	Assess and secure an incident site	No change

PMA08v2			PMA08v1		
PMAOMIR407B	Audit incident preparedness and established response system		PMAOMIR407B	Audit incident preparedness and established response system	No change
PMAOMIR418B	Coordinate incident response		PMAOMIR418B	Coordinate incident response	No change
PMAOMIR424B	Develop and maintain community relationships		PMAOMIR424B	Develop and maintain community relationships	No change
PMAOMIR430B	Conduct and assess incident exercises		PMAOMIR430B	Conduct and assess incident exercises	No change
PMAOMIR444B	Develop incident containment tactics		PMAOMIR444B	Develop incident containment tactics	No change
PMAOMIR449B	Monitor legal compliance obligations during incidents		PMAOMIR449B	Monitor legal compliance obligations during incidents	No change
PMAOMIR512B	Establish incident response preparedness and response systems		PMAOMIR512B	Establish incident response preparedness and response systems	No change
PMAOMIR523B	Manage corporate media requirements in a crisis		PMAOMIR523B	Manage corporate media requirements in a crisis	No change
PMAOMIR575B	Coordinate welfare support activities in response to an incident		PMAOMIR575B	Coordinate welfare support activities in response to an incident	No change
PMAOMIR622B	Build partnerships to improve incident response capacity		PMAOMIR622B	Build partnerships to improve incident response capacity	No change

PMA08v2			PMA08v1		
PMAOMIR6 50B	Manage a crisis		PMAOMIR6 50B	Manage a crisis	No change
PMAOPS10 1C	Read dials and indicators		PMAOPS10 1C	Read dials and indicators	No change
PMAOPS10 5C	Select and prepare materials		PMAOPS10 5C	Select and prepare materials	No change
PMAOPS20 1B	Operate fluid flow equipment		PMAOPS20 1B	Operate fluid flow equipment	No change
PMAOPS20 2B	Operate fluid mixing equipment		PMAOPS20 2B	Operate fluid mixing equipment	No change
PMAOPS20 3B	Handle goods		PMAOPS20 3B	Handle goods	No change
PMAOPS20 4B	Use utilities and services		PMAOPS20 4B	Use utilities and services	No change
PMAOPS20 5B	Operate heat exchangers		PMAOPS20 5B	Operate heat exchangers	No change
PMAOPS20 6B	Operate separation equipment		PMAOPS20 6B	Operate separation equipment	No change
PMAOPS20 7B	Operate powered separation equipment		PMAOPS20 7B	Operate powered separation equipment	No change
PMAOPS20 8B	Operate chemical separation equipment		PMAOPS20 8B	Operate chemical separation equipment	No change
PMAOPS21 0B	Operate particulates handling equipment		PMAOPS21 0B	Operate particulates handling equipment	No change
PMAOPS21 1B	Operate manufacturing extruders		PMAOPS21 1B	Operate manufacturing extruders	No change
PMAOPS21 3B	Package product/material		PMAOPS21 3B	Package product/material	No change

PMA08v2			PMA08v1		
PMAOPS21 6B	Operate local control system		PMAOPS21 6B	Operate local control system	No change
PMAOPS21 7B	Operate wet milling equipment		PMAOPS21 7B	Operate wet milling equipment	No change
PMAOPS22 0B	Monitor chemical reactions in the process		PMAOPS22 0B	Monitor chemical reactions in the process	No change
PMAOPS22 1B	Operate and monitor prime movers		PMAOPS22 1B	Operate and monitor prime movers	No change
PMAOPS22 2B	Operate and monitor pumping systems and equipment	Co-requisite unit - PMAOPS22 1B	PMAOPS22 2B	Operate and monitor pumping systems and equipment	No change
PMAOPS22 3B	Operate and monitor valve systems		PMAOPS22 3B	Operate and monitor valve systems	No change
PMAOPS22 4B	Provide fluids for utilities and support		PMAOPS22 4B	Provide fluids for utilities and support	No change
PMAOPS23 0B	Monitor, operate and maintain pipeline stations and equipment		PMAOPS23 0B	Monitor, operate and maintain pipeline stations and equipment	No change
PMAOPS23 1B	Control gas odourisation		PMAOPS23 1B	Control gas odourisation	No change
PMAOPS23 2B	Produce product by filtration		PMAOPS23 2B	Produce product by filtration	No change
PMAOPS23 3A	Monitor wells and gathering systems				New unit
PMAOPS23 4A	Monitor and operate low pressure compressors				New unit
PMAOPS24	Store liquids in		PMAOPS24	Store liquids in	No

PMA08v2			PMA08v1		
0B	bulk		0B	bulk	change
PMAOPS24 1A	Operate Joule-Thomson effect device				New unit
PMAOPS28 0B	Interpret process plant schematics		PMAOPS28 0A	Interpret process plant schematics	Wording clarified - equivalence
PMAOPS29 0B	Operate a bioreactor		PMAOPS29 0B	Operate a bioreactor	No change
PMAOPS30 0B	Operate a production unit		PMAOPS30 0B	Operate a production unit	No change
PMAOPS30 1B	Produce products by distillation	PMAOPS20 1B and Co-requisite unit PMAOPS20 5B	PMAOPS30 1B	Produce products by distillation	No change
PMAOPS30 2B	Operate reactors and reaction equipment		PMAOPS30 2B	Operate reactors and reaction equipment	No change
PMAOPS30 3B	Operate furnaces to induce reaction		PMAOPS30 3B	Operate furnaces to induce reaction	No change
PMAOPS30 4B	Operate and monitor compressor systems and equipment	Co-requisite unit - PMAOPS22 1B	PMAOPS30 4B	Operate and monitor compressor systems and equipment	No change
PMAOPS30 5B	Operate process control systems		PMAOPS30 5B	Operate process control systems	No change
PMAOPS30 7B	Transfer bulk fluids into/out of storage facility	PMAOPS20 1B	PMAOPS30 7B	Transfer bulk fluids into/out of storage facility	No change
PMAOPS30	Organise storage		PMAOPS30	Organise storage	No

PMA08v2			PMA08v1		
8B	and logistics of general materials		8B	and logistics of general materials	change
PMAOPS309B	Operate particulates handling/ storage equipment		PMAOPS309B	Operate particulates handling/ storage equipment	No change
PMAOPS312B	Undertake ship loading/unloading operations		PMAOPS312B	Undertake ship loading/unloading operations	No change
PMAOPS319A	Adjust batch		PMAOPS319A	Adjust batch	No change
PMAOPS320B	Conduct artificial lift		PMAOPS320B	Conduct artificial lift	No change
PMAOPS321B	Undertake well management		PMAOPS321B	Undertake well management	No change
PMAOPS323A	Operate and monitor heating furnace		PMAOPS323A	Operate and monitor heating furnace	No change
PMAOPS324A	Operate a gas turbine		PMAOPS324A	Operate a gas turbine	No change
PMAOPS325B	Generate electrical power		PMAOPS325B	Generate electrical power	No change
PMAOPS326B	Produce product using gas absorption		PMAOPS326B	Produce product using gas absorption	No change
PMAOPS327B	Produce product using fixed bed dehydration		PMAOPS327B	Produce product using fixed bed dehydration	No change
PMAOPS329B	Produce product using liquid extraction		PMAOPS329B	Produce product using liquid extraction	No change
PMAOPS330B	Communicate pipeline control centre operations		PMAOPS330B	Communicate pipeline control centre operations	No change

PMA08v2			PMA08v1		
PMAOPS33 3A	Operate wells and gathering systems				New unit
PMAOPS33 5A	Conduct pipeline pigging		PMAOPS33 5A	Conduct pipeline pigging	No change
PMAOPS34 0B	Operate cryogenic processes		PMAOPS34 0B	Operate cryogenic processes	No change
PMAOPS35 0B	Match and adjust colour		PMAOPS35 0B	Match and adjust colour	No change
PMAOPS39 0B	Operate a biochemical process		PMAOPS39 0B	Operate a biochemical process	No change
PMAOPS40 2A	Respond to abnormal process situations	MSAPMSUP 390A	PMAOPS40 2A	Respond to abnormal process situations	No change
PMAOPS40 5A	Operate complex control systems		PMAOPS40 5A	Operate complex control systems	No change
PMAOPS41 0B	Monitor remote production facilities		PMAOPS41 0B	Monitor remote production facilities	No change
PMAOPS41 1B	Manage plant shutdown and restart		PMAOPS41 1B	Manage plant shutdown and restart	No change
PMAOPS43 3A	Manage wells and gathering systems				New unit
PMAOPS43 4A	Commission wells and gathering systems				New unit
PMAOPS45 0B	Solve colour problems		PMAOPS45 0B	Solve colour problems	No change
PMAOPS50 0A	Optimise production systems		PMAOPS50 0A	Optimise production systems	No change
PMAOPS50 1A	Provide operational		PMAOPS50 1A	Provide operational	No change

PMA08v2			PMA08v1		
	expertise to a project team			expertise to a project team	
PMAOPS50 5A	Control the process in abnormal situations		PMAOPS50 5A	Control the process in abnormal situations	No change
PMAOPS51 1B	Determine energy transfer loads		PMAOPS51 1B	Determine energy transfer loads	No change
PMAOPS51 2B	Determine mass transfer loads		PMAOPS51 2B	Determine mass transfer loads	No change
PMAOPS52 0C	Manage utilities		PMAOPS52 0C	Manage utilities	No change
PMAOPS52 1C	Plan plant shutdown		PMAOPS52 1C	Plan plant shutdown	No change
PMAOPS52 2A	Coordinate plant shut down		PMAOPS52 2A	Coordinate plant shut down	No change
PMAOPS55 0B	Develop a colour formulation	PMAOPS35 0B PMAOPS45 0B	PMAOPS55 0B	Develop a colour formulation	No change
PMAOPS60 0C	Modify plant		PMAOPS60 0C	Modify plant	No change
PMAOPS60 1A	Debottleneck plant		PMAOPS60 1A	Debottleneck plant	No change
PMAOPS75 1A	Use of physiochemical knowledge to select raw materials for surface coatings		PMAOPS75 1A	Use of physiochemical knowledge to select raw materials for surface coatings	No change
PMAOPS75 2A	Develop a decorative coating		PMAOPS75 2A	Develop a decorative coating	No change
PMAOPS75 3A	Develop a non-decorative		PMAOPS75 3A	Develop a non-decorative	No change

PMA08v2			PMA08v1		
	coating or ink			coating or ink	
PMAOPS75 5A	Provide surface coatings application advice		PMAOPS75 5A	Provide surface coatings application advice	No change
PMASMELT 260B	Form carbon anodes		PMASMELT 260B	Form carbon anodes	No change
PMASMELT 261B	Bake carbon anodes		PMASMELT 261B	Bake carbon anodes	No change
PMASMELT 262B	Clean and strip anode rods		PMASMELT 262B	Clean and strip anode rods	No change
PMASMELT 263B	Spray carbon anodes		PMASMELT 263B	Spray carbon anodes	No change
PMASMELT 264B	Start up reduction cells		PMASMELT 264B	Start up reduction cells	No change
PMASMELT 265B	Operate reduction cells		PMASMELT 265B	Operate reduction cells	No change
PMASMELT 266B	Deliver molten metal		PMASMELT 266B	Deliver molten metal	No change
PMASMELT 267B	Cast aluminium ingots		PMASMELT 267B	Cast aluminium ingots	No change
PMASMELT 268B	Vertical direct casting		PMASMELT 268B	Vertical direct casting	No change
PMASMELT 269A	Operate cell tending equipment		PMASMELT 269A	Operate cell tending equipment	No change
PMASMELT 270A	Supply product from reduction cells		PMASMELT 270A	Supply product from reduction cells	No change
PMASUP23 6B	Operate vehicles in the field		PMASUP23 6B	Operate vehicles in the field	No change
PMASUP23 7B	Undertake crane, dogging and load transfer operations		PMASUP23 7B	Undertake crane, dogging and load transfer operations	No change
PMASUP24	Maintain pipeline		PMASUP24	Maintain pipeline	No

PMA08v2			PMA08v1		
1B	easements		1B	easements	change
PMASUP24 2B	Monitor pipeline civil works		PMASUP24 2B	Monitor pipeline civil works	No change
PMASUP24 3B	Monitor and maintain pipeline coatings		PMASUP24 3B	Monitor and maintain pipeline coatings	No change
PMASUP30 5A	Operate Offshore Cranes		PMASUP30 5A	Operate Offshore Cranes	No change
PMASUP31 1A	Operate communications hub		PMASUP31 1A	Operate communications hub	No change
PMASUP34 1B	Monitor and maintain instrument and control systems	MSAPMPER 300C	PMASUP34 1B	Monitor and maintain instrument and control systems	Pre-requ isite updated - equivale nt
PMASUP34 2B	Monitor and maintain electrical systems	MSAPMPER 300C	PMASUP34 2B	Monitor and maintain electrical systems	Pre-requ isite updated - equivale nt
PMASUP34 3B	Monitor and maintain cathodic protection systems		PMASUP34 3B	Monitor and maintain cathodic protection systems	No change
PMASUP34 4B	Monitor and control repairs and modifications on operational pipe		PMASUP34 4B	Monitor and control repairs and modifications on operational pipe	No change
PMASUP34 5A	Monitor vibration		PMASUP34 5A	Monitor vibration	No change
PMASUP34 6A	Control corrosion		PMASUP34 6A	Control corrosion	No change
PMASUP34 7A	Undertake corrosion		PMASUP34 7A	Undertake corrosion	No change

PMA08v2			PMA08v1		
	inspection in a petrochemical environment			inspection in a petrochemical environment	
PMASUP410B	Develop plant documentation		PMASUP410B	Develop plant documentation	No change
PMASUP420B	Minimise environmental impact of process		PMASUP420B	Minimise environmental impact of process	No change
PMASUP432B	Coordinate pipeline projects		PMASUP432B	Coordinate pipeline projects	No change
PMASUP440B	Commission/recommission plant		PMASUP440B	Commission/recommission plant	No change
PMASUP441C	Decommission plant		PMASUP441C	Decommission plant	No change
PMASUP445A	Participate in HAZOP studies	PMAOPS280B	PMASUP445A	Participate in HAZOP studies	Pre-requisite updated - equivalent
PMASUP520B	Review procedures to minimise environmental impact of process		PMASUP520B	Review procedures to minimise environmental impact of process	No change
PMASUP540B	Analyse equipment performance		PMASUP540B	Analyse equipment performance	No change
PMASUP620B	Manage environmental management system	PMASUP520B	PMASUP620B	Manage environmental management system	No change
PSPGOV308B	Work effectively with diversity		PSPGOV308B	Work effectively with diversity	No change
PSPMNGT604B	Manage change		PSPMNGT604B	Manage change	No change

PMA08v2			PMA08v1		
PSPMNGT605B	Manage diversity		PSPMNGT605B	Manage diversity	No change
RIIOHS204A	Work safely at heights		MNMMG237A	Work safely at heights	Updated - equivalent
RIIRIS201A	Conduct local risk control		MNMC205A	Conduct Local Risk Assessment	Updated - equivalent
TAEASS301A	Contribute to assessment		TAAASS301A	Contribute to assessment	Updated - equivalent
TAEASS401A	Plan assessment activities and processes		TAAASS401A	Plan and organise assessment	Enhanced – outcomes equivalent
TAEASS402A	Assess competence		TAAASS402A	Assess competence	Updated - equivalent
TAEASS403A	Participate in assessment validation		TAAASS404A	Participate in assessment validation (partial equivalence)	Updated - equivalent
TAEDEL301A	Provide work skill instruction		TAADEL301A	Provide training through instruction and demonstration of work skills	Modified - equivalent
TLID1007C	Operate a forklift		TDTD1097C	Operate a forklift	Updated - equivalent
UEPOPS319	Operate and		UTPNEG167	Operate and	Updated

PMA08v2			PMA08v1		
A	Monitor Gas Production Plant		A	Monitor Gas Production Plant	- equivalent
UEPOPS340 A	Operate and Monitor a Steam Turbine		UEPOPS340 A	Operate and Monitor a Steam Turbine	No change

PMA08 to PMA02

PMA08			Related unit in PMA02	
Unit code	Unit title	Unit code	Unit title	Comment / Relationship
PMAOHS211 B	Prepare equipment for emergency response	PMAOHS211 A	Prepare equipment for emergency response	Equivalent
PMAOHS213 B	Undertake fire control and emergency rescue	PMAOHS213 A	Undertake fire control and emergency rescue	Equivalent
PMAOHS214 B	Undertake helicopter safety and escape	PMAOHS214 A	Undertake helicopter safety and escape	Equivalent
PMAOHS215 B	Apply offshore facility abandonment and sea survival procedures	PMAOHS215 A	Apply offshore facility abandonment and sea survival procedures	Equivalent
PMAOHS221 B	Maintain First Aid supplies and records	PMAOHS221 A	Maintain First Aid supplies and records	Equivalent
PMAOHS310 B	Investigate incidents	PMAOHS310 A	Investigate incidents	Equivalent
PMAOHS311 B	Lead emergency teams	PMAOHS311 A	Lead emergency teams	Equivalent
PMAOHS312 B	Command the operation of survival craft	PMAOHS312 A	Command the operation of survival craft	Equivalent

PMA08			Related unit in PMA02	
PMAOHS320 C	Provide advanced First Aid response	PMAOHS320 B	Provide advanced First Aid response	Equivalent
PMAOHS321 B	Provide First Aid response in remote and/or isolated area	PMAOHS321 A	Provide First Aid response in remote and/or isolated area	Equivalent
PMAOHS420 B	Develop First Aid procedures and manage resources	PMAOHS420 A	Develop First Aid procedures and manage resources	Equivalent
PMAOHS502 B	Contribute to safety case	PMAOHS502 A	Contribute to safety case	Equivalent
PMAOHS511 A	Manage emergency incidents	PMAOHS410 B	Manage emergency incidents	Equivalent, but realigned
PMAOMIR21 0B	Control evacuation to muster point	PMAOMIR21 0A	Control evacuation to muster point	Equivalent
PMAOMIR30 1B	Undertake initial rescue	PMAOMIR30 1A	Undertake initial rescue	Equivalent
PMAOMIR30 2B	Respond to a helideck incident	PMAOMIR30 2A	Respond to a helideck incident	Equivalent
PMAOMIR31 7B	Facilitate search and rescue operations	PMAOMIR31 7A	Facilitate search and rescue operations	Equivalent
PMAOMIR32 0B	Manage incident response information	PMAOMIR32 0A	Manage incident response information	Equivalent
PMAOMIR32 1B	Manage communication systems during an incident	PMAOMIR32 1A	Manage communication systems during an incident	Equivalent
PMAOMIR34 6B	Assess and secure an incident site	PMAOMIR34 6A	Assess and secure an incident site	Equivalent
PMAOMIR40 7B	Audit incident preparedness and established response system	PMAOMIR40 7A	Audit incident preparedness and established response system	Equivalent
PMAOMIR41	Coordinate incident	PMAOMIR41	Coordinate incident	Equivalent

PMA08			Related unit in PMA02	
8B	response	8A	response	
PMAOMIR42 4B	Develop and maintain community relationships	PMAOMIR42 4A	Develop and maintain community relationships	Equivalent
PMAOMIR43 0B	Conduct and assess incident exercises	PMAOMIR43 0A	Conduct and assess incident exercises	Equivalent
PMAOMIR44 4B	Develop incident containment tactics	PMAOMIR44 4A	Develop incident containment tactics	Equivalent
PMAOMIR44 9B	Monitor legal compliance obligations during incidents	PMAOMIR44 9A	Monitor legal compliance obligations during incidents	Equivalent
PMAOMIR51 2B	Establish incident response preparedness and response systems	PMAOMIR51 2A	Establish incident response preparedness and response systems	Equivalent
PMAOMIR52 3B	Manage corporate media requirements in a crisis	PMAOMIR52 3A	Manage corporate media requirements in a crisis	Equivalent
PMAOMIR57 5B	Coordinate welfare support activities in response to an incident	PMAOMIR57 5A	Coordinate welfare support activities in response to an incident	Equivalent
PMAOMIR62 2B	Build partnerships to improve incident response capacity	PMAOMIR62 2A	Build partnerships to improve incident response capacity	Equivalent
PMAOMIR65 0B	Manage a crisis	PMAOMIR65 0A	Manage a crisis	Equivalent
PMAOPS101C	Read dials and indicators	PMAOPS101 B	Read dials and indicators	Equivalent
PMAOPS105C	Select and prepare materials	PMAOPS105 B	Select and prepare materials	Equivalent
PMAOPS201B	Operate fluid flow equipment	PMAOPS201 A	Operate fluid flow equipment	Equivalent

PMA08			Related unit in PMA02	
PMAOPS202B	Operate fluid mixing equipment	PMAOPS202 A	Operate fluid mixing equipment	Equivalent
PMAOPS203B	Handle goods	PMAOPS203 A	Handle goods	Equivalent
PMAOPS204B	Use utilities and services	PMAOPS204 A	Use utilities and services	Equivalent
PMAOPS205B	Operate heat exchangers	PMAOPS205 A	Operate heat exchangers	Equivalent
PMAOPS206B	Operate separation equipment	PMAOPS206 A	Operate separation equipment	Equivalent
PMAOPS207B	Operate powered separation equipment	PMAOPS207 A	Operate powered separation equipment	Equivalent
PMAOPS208B	Operate chemical separation equipment	PMAOPS208 A	Operate chemical separation equipment	Equivalent
PMAOPS210B	Operate particulates handling equipment	PMAOPS210 A	Operate particulates handling equipment	Equivalent
PMAOPS211B	Operate manufacturing extruders	PMAOPS211 A	Operate manufacturing extruders	Equivalent
PMAOPS213B	Package product/material	PMAOPS213 A	Package product/material	Equivalent
PMAOPS216B	Operate local control system	PMAOPS216 A	Operate local control system	Equivalent
PMAOPS217B	Operate wet milling equipment	PMAOPS217 A	Operate wet milling equipment	Equivalent
PMAOPS220B	Monitor chemical reactions in the process	PMAOPS220 A	Monitor chemical reactions in the process	Equivalent
PMAOPS221B	Operate and monitor prime movers	PMAOPS221 A	Operate and monitor prime movers	Equivalent
PMAOPS222B	Operate and monitor pumping systems and	PMAOPS222 A	Operate and monitor pumping systems and	Equivalent

PMA08			Related unit in PMA02	
	equipment		equipment	
PMAOPS223B	Operate and monitor valve systems	PMAOPS223 A	Operate and monitor valve systems	Equivalent
PMAOPS224B	Provide fluids for utilities and support	PMAOPS224 A	Provide fluids for utilities and support	Equivalent
PMAOPS230B	Monitor, operate and maintain pipeline stations and equipment	PMAOPS230 A	Monitor, operate and maintain pipeline stations and equipment	Equivalent
PMAOPS231B	Control gas odourisation	PMAOPS231 A	Control gas odourisation	Equivalent
PMAOPS232B	Produce product by filtration	PMAOPS232 A	Produce product by filtration	Equivalent
PMAOPS240B	Store liquids in bulk	PMAOPS240 A	Store liquids in bulk	Equivalent
PMAOPS280A	Interpret process plant schematics			New unit
PMAOPS290B	Operate a biotreater	PMAOPS290 A	Operate a biotreater	Equivalent
PMAOPS300B	Operate a production unit	PMAOPS300 A	Operate a production unit	Equivalent
PMAOPS301B	Produce product by distillation	PMAOPS301 A	Produce product by distillation	Equivalent
PMAOPS302B	Operate reactors and reaction equipment	PMAOPS302 A	Operate reactors and reaction equipment	Equivalent
PMAOPS303B	Operate furnaces to induce reaction	PMAOPS303 A	Operate furnaces	Equivalent, but has been refined to distinguish from PMAOPS323
PMAOPS304B	Operate and monitor compressor systems	PMAOPS304 A	Operate and monitor compressor systems	Equivalent

PMA08			Related unit in PMA02	
	and equipment		and equipment	
PMAOPS305B	Operate process control systems	PMAOPS305 A	Operate process control systems	Equivalent, but has been modified to distinguish from PMAOPS216 and PMAOPS405
PMAOPS307B	Transfer bulk fluids into/out of storage facility	PMAOPS307 A	Transfer bulk fluids into/out of storage facility	Equivalent
PMAOPS308B	Organise storage and logistics of general materials	PMAOPS308 A	Organise storage and logistics of general materials	Equivalent
PMAOPS309B	Operate particulates handling/ storage equipment	PMAOPS309 A	Operate particulates handling/ storage equipment	Equivalent
PMAOPS312B	Undertake ship loading/unloading operations	PMAOPS312 A	Undertake ship loading/unloading operations	Equivalent
PMAOPS319A	Adjust batch			New unit
PMAOPS320B	Conduct artificial lift	PMAOPS320 A	Conduct artificial lift	Equivalent
PMAOPS321B	Undertake well management	PMAOPS321 A	Undertake well management	Equivalent
PMAOPS323A	Operate and monitor heating furnace			New unit has been added to avoid confusion with PMAOPS303 A
PMAOPS324A	Operate a gas turbine			New unit
PMAOPS325B	Generate electrical power	PMAOPS325 A	Generate electrical power	Equivalent

PMA08			Related unit in PMA02	
PMAOPS326B	Produce product using gas absorption	PMAOPS326 A	Produce product using gas absorption	Equivalent
PMAOPS327B	Produce product using fixed bed dehydration	PMAOPS327 A	Produce product using fixed bed dehydration	Equivalent
PMAOPS329B	Produce product using liquid extraction	PMAOPS329 A	Produce product using liquid extraction	Equivalent
PMAOPS330B	Communicate pipeline control centre operations	PMAOPS330 A	Communicate pipeline control centre operations	Equivalent
PMAOPS335A	Conduct pipeline pigging	PMASUP340 A	Conduct pipeline pigging	Equivalent but has been moved from support to technical
PMAOPS340B	Operate cryogenic processes	PMAOPS340 A	Operate cryogenic processes	Equivalent
PMAOPS350B	Match and adjust colour	PMAOPS350 A	Match and adjust colour	Equivalent
PMAOPS390B	Operate a biochemical process	PMAOPS390 A	Operate a biochemical process	Equivalent
PMAOPS402A	Respond to abnormal process situations			New unit developed to address advanced problem solving
PMAOPS405A	Operate complex control systems			New unit developed to cater for advanced controllers
PMAOPS410B	Monitor remote production facilities	PMAOPS410 A	Monitor remote production facilities	Equivalent

PMA08			Related unit in PMA02	
PMAOPS411B	Manage plant shutdown and restart	PMAOPS411 A	Manage plant shutdown and restart	Equivalent
PMAOPS450B	Solve colour problems	PMAOPS450 A	Solve colour problems	Equivalent
PMAOPS500A	Optimise production systems			New unit
PMAOPS501A	Provide operational expertise to a project team			New unit
PMAOPS505A	Control the process during abnormal situations			New unit
PMAOPS511B	Determine energy transfer loads	PMAOPS511 A	Determine energy transfer loads	Equivalent
PMAOPS512B	Determine mass transfer loads	PMAOPS512 A	Determine mass transfer loads	Equivalent
PMAOPS520C	Manage utilities	PMAOPS520 B	Manage utilities	Equivalent
PMAOPS521C	Plan plant shutdown	PMAOPS521 B	Plan plant shutdown	Equivalent
PMAOPS522A	Coordinate plant shut down			New unit
PMAOPS550B	Develop a colour formulation	PMAOPS550 A	Develop a colour formulation	Equivalent
PMAOPS600C	Modify plant	PMAOPS600 B	Modify plant	Equivalent
PMAOPS601A	Debottleneck plant			New unit
PMAOPS751A	Apply physiochemical knowledge to select raw materials for surface coatings			New unit, written for Vocational Graduate Certificate in surface

PMA08			Related unit in PMA02	
				coatings
PMAOPS752A	Develop a decorative coating			New unit, written for Vocational Graduate Certificate in surface coatings
PMAOPS753A	Develop a non-decorative coating or ink			New unit, written for Vocational Graduate Certificate in surface coatings
PMAOPS755A	Provide surface coatings application advice			New unit, written for Vocational Graduate Certificate in surface coatings
PMASMELT2 60B	Form carbon anodes	PMASMELT2 60A	Form carbon anodes	Equivalent
PMASMELT2 61B	Bake carbon anodes	PMASMELT2 61A	Bake carbon anodes	Equivalent
PMASMELT2 62B	Clean and strip anode rods	PMASMELT2 62A	Clean and strip anode rods	Equivalent
PMASMELT2 63B	Spray carbon anodes	PMASMELT2 63A	Spray carbon anodes	Equivalent
PMASMELT2 64B	Start up reduction cells	PMASMELT2 64A	Start up reduction cells	Equivalent
PMASMELT2 65B	Operate reduction cells	PMASMELT2 65A	Operate reduction cells	Equivalent
PMASMELT2 66B	Deliver molten metal	PMASMELT2 66A	Deliver molten metal	Equivalent

PMA08			Related unit in PMA02	
PMASMELT2 67B	Cast aluminium ingots	PMASMELT2 67A	Cast aluminium ingots	Equivalent
PMASMELT2 68B	Vertical direct casting	PMASMELT2 68A	Vertical Direct Casting	Equivalent
PMASMELT2 69A	Operate cell tending equipment	PMASMELT2 69A	Operate cell tending equipment	Equivalent
PMASMELT2 70A	Supply product from reduction cells			New unit
PMASUP236B	Operate vehicles in the field	PMASUP236 A	Operate vehicles in the field	Equivalent
PMASUP237B	Undertake crane, dogging and load transfer operations	PMASUP237 A	Undertake crane, dogging and load transfer operations	Equivalent
PMASUP241B	Maintain pipeline easements	PMASUP241 A	Maintain pipeline easements	Equivalent
PMASUP242B	Monitor pipeline civil works	PMASUP242 A	Monitor pipeline civil works	Equivalent
PMASUP243B	Monitor and maintain pipeline coatings	PMASUP243 A	Monitor and maintain pipeline coatings	Equivalent
PMASUP305A	Operate Offshore Cranes	PMASUP305 A	Operate Offshore Cranes	Equivalent
PMASUP311A	Operate communications hub			New unit
PMASUP341B	Monitor and maintain instrument and control systems	PMASUP341 A	Monitor and maintain instrument and control systems	Equivalent
PMASUP342B	Monitor and maintain electrical systems	PMASUP342 A	Monitor and maintain electrical systems	Equivalent
PMASUP343B	Monitor and maintain cathodic protection systems	PMASUP343 A	Monitor and maintain cathodic protection systems	Equivalent

PMA08			Related unit in PMA02	
PMASUP344B	Monitor and control repairs and modifications on operational pipe	PMASUP344 A	Monitor and control repairs and modifications on operational pipe	Equivalent
PMASUP345A	Monitor vibration			New unit
PMASUP346A	Control corrosion			New unit
PMASUP347A	Undertake corrosion inspection in a petrochemical environment	9597 v 3	Undertake corrosion inspection in a petrochemical environment	Equivalent, based on the previous NZ unit but now in Australian format
PMASUP410B	Develop plant documentation	PMASUP410 A	Develop plant documentation	Equivalent
PMASUP420B	Minimise environmental impact of process	PMASUP420 A	Minimise environmental impact of process	Equivalent
PMASUP432B	Coordinate pipeline projects	PMASUP432 A	Coordinate pipeline projects	Equivalent
PMASUP440B	Commission/recomm ission plant	PMASUP440 A	Commission/recomm ission plant	Equivalent
PMASUP441C	Decommission plant	PMASUP441 B	Decommission plant	Equivalent
PMASUP445A	Participate in HAZOP studies	9630 v 3	Demonstrate knowledge of HAZOP study and QRA in a petrochemical environment	Equivalent, based on the previous NZ unit but now in Australian format
PMASUP520B	Review procedures to minimise environmental impact of process	PMASUP520 A	Review procedures to minimise environmental impact of process	Equivalent
PMASUP540B	Analyse equipment	PMASUP540	Analyse equipment	Equivalent

PMA08			Related unit in PMA02	
	performance	A	performance	
PMASUP620B	Manage environmental management system	PMASUP620 A	Manage environmental management system	Equivalent
		PMAPER units		Replaced by MSAPMPER units
Imported units				
FDFPHGMP1 A	Follow work procedures to maintain Good Manufacturing Practice	FDFCORGMP 1A	Apply basic good manufacturing practice	Equivalent
FDFPHGMP2 B	Implement Good Manufacturing Practice procedures	FDFCORGMP 2A	Implement good manufacturing practice	Equivalent
FDFPHGMP3 A	Monitor the implementation of Good Manufacturing Practice procedures	FDFCORGMP 3A	Monitor the implementation of good manufacturing practice	Equivalent
MEM05012C	Perform routine manual metal arc welding			New to PMA
MEM07033B	Operate and monitor basic boiler	UTPNEG162 A	Operate and monitor boiler steam/water cycle	A replacement unit catering for two grades of license
MEM07034A	Operate and monitor intermediate class boiler	UTPNEG162 A	Operate and monitor boiler steam/water cycle	A replacement unit catering for two grades of license
MEM09002B	Interpret technical drawing			New to PMA
MEM09003B	Prepare basic			New to PMA

PMA08			Related unit in PMA02	
	engineering drawing			
MEM11011B	Undertake manual handling			New to PMA
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	BSATEM201A	Participate in the allocation and completion of team tasks	This unit has similar outcomes and should be used as the replacement
MEM18011C	Shutdown and isolate machines/equipment			New to PMA
MNMC205A	Conduct Local Risk Assessment			New to PMA
MNMG237A	Work safely at heights			New to PMA
MSACMC411A	Lead a competitive manufacturing team			New to PMA
MSACMC413A	Lead team culture improvement			New to PMA
MSACMC610A	Manage relationships with non-customer external organisations			New to PMA
MSACMC611A	Manage people relationships			New to PMA
MSACMC612A	Manage workplace learning			New to PMA
MSACMS201A	Sustain process improvements			New to PMA
MSACMS401A	Ensure process improvements are sustained			New to PMA
MSACMT230	Apply cost factors to			New to PMA

PMA08			Related unit in PMA02	
A	work practices			
MSACMT231 A	Interpret product costs in terms of customer requirements			New to PMA
MSACMT240 A	Apply 5S procedures in a manufacturing environment			New to PMA
MSACMT250 A	Monitor process capability			New to PMA
MSACMT251 A	Apply quality standards			New to PMA
MSACMT260 A	Use planning software systems in manufacturing			New to PMA
MSACMT270 A	Use sustainable energy practices			New to PMA
MSACMT271 A	Use sustainable environmental practices			New to PMA
MSACMT280 A	Undertake root cause analysis			New to PMA
MSACMT281 A	Contribute to the application of a proactive maintenance strategy			New to PMA
MSACMT430 A	Improve cost factors in work practices			New to PMA
MSACMT440 A	Lead 5S in a manufacturing environment			New to PMA
MSACMT441 A	Facilitate continuous improvement in manufacturing			New to PMA

PMA08			Related unit in PMA02	
MSACMT450 A	Undertake process capability improvements			New to PMA
MSACMT451 A	Mistake proof a production process			New to PMA
MSACMT452 A	Apply statistics to processes in manufacturing			New to PMA
MSACMT460 A	Facilitate the use of planning software systems in manufacturing			New to PMA
MSACMT481 A	Undertake proactive maintenance analyses			New to PMA
MSACMT482 A	Assist in implementing a proactive maintenance strategy			New to PMA
MSACMT630 A	Optimise cost of product			New to PMA
MSACMT640 A	Manage 5S system in a manufacturing environment			New to PMA
MSACMT641 A	Implement a continuous improvement system			New to PMA
MSACMT650 A	Determine and improve process capability			New to PMA
MSACMT660 A	Develop the application of enterprise systems in manufacturing			New to PMA

PMA08			Related unit in PMA02	
MSACMT661 A	Determine and establish information collection requirements and processes			New to PMA
MSACMT670 A	Develop and manage sustainable energy practices			New to PMA
MSACMT671 A	Develop and manage sustainable environmental practices			New to PMA
MSACMT681 A	Develop a proactive maintenance strategy			New to PMA
MSAENV272 A	Participate in environmentally sustainable work practices	PMASUP220 A	Monitor and control environmental hazards	Equivalent
MSAENV472 A	Implement and monitor environmentally sustainable work practices	PMASUP320 A	Implement and monitor environmental policies	Replaced with a contextualised guideline unit
MSAENV672 A	Develop workplace policy and procedures for sustainability			New to PMA
MSAPMOHS1 00A	Follow OHS procedures	PMAOHS100 C	Follow OHS procedures	Equivalent
MSAPMOHS1 10A	Follow emergency response procedures	PMAOHS110 B	Respond to emergency situation	Equivalent
MSAPMOHS2 00A	Work safely	PMAOHS200 B	Participate in workplace safety procedures	Equivalent
MSAPMOHS2	Control minor	PMAOMIR20	Control minor	Equivalent

PMA08			Related unit in PMA02	
05A	incidents	5A	incidents	
MSAPMOHS210B	Undertake first response to non-fire incidents	PMAOHS210B	Undertake first response to non-fire incidents	Equivalent, there has been a wording change to better reflect industry usage
MSAPMOHS212A	Undertake first response to fire incidents	PMAOHS212B	Undertake first response to fire incidents	Equivalent
MSAPMOHS216A	Operate breathing apparatus	PMAOHS216B	Operate breathing apparatus	Equivalent
MSAPMOHS217A	Gas test atmospheres	PMAOMIR217A	Gas test atmospheres	Equivalent
MSAPMOHS220A	Provide initial First Aid response	PMAOHS220A	Provide initial First Aid response	Equivalent
MSAPMOHS300A	Facilitate the implementation of OHS for a work group	PMAOHS300B	Implement and monitor OHS policies and procedures for a workgroup	Equivalent
MSAPMOHS400A	Contribute to workplace OHS management system	PMAOHS400B	Contribute to workplace OHS management system	Equivalent
MSAPMOHS401A	Assess risk	PMAOHS401B	Assess risk	Equivalent
MSAPMOHS503A	Maintain the workplace OHS management system	PMAOHS503A	Maintain workplace OHS management system	Equivalent
MSAPMOHS510A	Manage risk	PMAOHS510B	Manage risk	Equivalent
MSAPMOHS601A	Establish workplace OHS management system	PMAOHS601A	Establish workplace OHS management system	Equivalent

PMA08			Related unit in PMA02	
MSAPMOPS100A	Use equipment	PMAOPS100A	Use equipment to procedures	Equivalent
MSAPMOPS102A	Perform tasks to support production			New to PMA
MSAPMOPS200A	Operate equipment	PMAOPS200A	Operate and monitor an item of equipment	Equivalent
MSAPMOPS212A	Use enterprise computers or data systems	PMAOPS212A	Use enterprise data system	Equivalent
MSAPMOPS400A	Optimise process/plant area	PMAOPS400A	Optimise operating systems	Equivalent
MSAPMOPS401A	Trial new process product	PMAOPS401B	Trial new process/product	Equivalent
MSAPMOPS404A	Co-ordinate maintenance			New to PMA
MSAPMOPS405A	Identify problems in fluid power system			New to PMA
MSAPMOPS406A	Identify problems in electronic control systems			New to PMA
		PMAPER302B	Issue work permits (hot work/confined space)	Not carried forward. The industry committee regarded this unit as too similar to MSAPMPER300B
MSAPMPER200B	Work in accordance with an issued permit	PMAPER200C	Work in accordance with an issued permit	Equivalent
MSAPMPER201A	Monitor and control work permits	PMAPER201C	Monitor and control work permits	Equivalent

PMA08			Related unit in PMA02	
MSAPMPER202A	Observe permit work			New unit
MSAPMPER205B	Enter confined space	PMAPER205B	Enter confined space	Equivalent
MSAPMPER300B	Issue work permits	PMAPER300C	Issue work permits	Equivalent but has been modified to include hot work and confined space permits
MSAPMPER400A	Coordinate permit process			New unit
MSAPMSUP100A	Apply workplace procedures	PMASUP100B	Apply workplace procedures	Equivalent
MSAPMSUP101A	Clean workplace or equipment	PMAOPS102A	Undertake housekeeping operations	Equivalent
MSAPMSUP102A	Communicate in the workplace	PMASUP110A	Relay and respond to information	Equivalent
		PMASUP130B	Follow established work plan	Not carried forward
MSAPMSUP106A	Work in a team	BSATEM101A	Participate in team to achieve designated goals	Equivalent
MSAPMSUP172A	Identify and minimise environmental hazards	PMASUP120A	Follow environmental work practices	Equivalent
MSAPMSUP200A	Achieve work outcomes	PMASUP200B	Implement production efficiencies	Equivalent
MSAPMSUP201A	Receive or despatch goods	MSASUP201A	Receive or despatch goods	Equivalent

PMA08			Related unit in PMA02	
MSAPMSUP204A	Pack products or materials			New to PMA
MSAPMSUP205A	Transfer loads			New to PMA
MSAPMSUP210A	Process and record information	PMASUP210A	Process and record information	Equivalent
MSAPMSUP240A	Undertake minor maintenance	PMASUP240A	Undertake minor maintenance	Equivalent
MSAPMSUP280A	Manage conflict at work			New to PMA
MSAPMSUP291A	Participate in continuous improvement			New to PMA
MSAPMSUP292A	Sample and test materials and product	PMCSUP292A	Sample and test materials and product	Equivalent
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	PMASUP300B	Identify and implement opportunities to maximise production efficiencies	Equivalent
MSAPMSUP301A	Apply HACCP to the workplace			New to PMA
MSAPMSUP303A	Identify equipment faults	PMBMAINT303B	Identify equipment faults	Equivalent
MSAPMSUP309A	Maintain and organise workplace records	MSASUP309A	Maintain and organise workplace records	Equivalent
MSAPMSUP310A	Contribute to development of plant documentation			New to PMA
MSAPMSUP330A	Develop and adjust a production schedule	PMASUP330B	Schedule production	Equivalent
MSAPMSUP3	Provide			New to PMA

PMA08			Related unit in PMA02	
82A	coaching/mentoring in the workplace			
MSAPMSUP3 83A	Facilitate a team	BSATEM301 A	Negotiate with team members to allocate and complete tasks	Equivalent
MSAPMSUP3 90A	Use structured problem solving tools	PMASUP390 A	Use structured problem solving tools	Equivalent
MSAPMSUP4 00A	Develop and monitor quality systems			New to PMA
PMLQUAL60 0B	Maintain quality system and continuous improvement processes within work/functional area			New to PMA
PMLSAMP20 0A	Collect routine site samples			New to PMA
PMLSAMP40 0B	Obtain representative samples in accordance with a sampling plan	PMLSAMP40 0A	Obtain representative samples in accordance with a sampling plan	Equivalent
PMLTEST300 B	Perform basic tests	PMLTEST300 A	Perform basic tests	Equivalent
PMLTEST603 A	Evaluate and select appropriate test methods and/or procedures			New to PMA
PMLTEST700 B	Contribute to the development of products and applications			New to PMA
PMLTEST701 B	Troubleshoot equipment and production processes			New to PMA

PMA08			Related unit in PMA02	
PMLTEST703 B	Develop or adapt analyses and procedures			New to PMA
PSPGOV308B	Work effectively with diversity	PSPGOV308A	Work effectively with diversity	Equivalent
PSPMNGT604 B	Manage change	PSPMNGT604A	Manage change	Equivalent
PSPMNGT605 B	Manage diversity	PSPMNGT605A	Manage diversity	Equivalent
PUAFIR306A	Render hazardous materials safe	PUAFIR306A	Render hazardous materials safe	Equivalent
PUASAR003A	Undertake technical rescue	PUASAR003A	Undertake technical rescue	Equivalent
PUASAR004A	Undertake vertical rescue	PUASAR004A	Undertake vertical rescue	Equivalent
PUASAR005A	Undertake Confined Space Rescue			New to PMA
TAAASS301A	Contribute to assessment			New to PMA
TAAASS401A	Plan and organise assessment	BSZ401A	Plan assessment	Equivalent
TAAASS402A	Assess competence	BSZ402A	conduct assessment	Equivalent
TAAASS404A	Participate in assessment validation (partial equivalence)	BSZ403A	review assessment	Partially equivalent – See TAA04 for details
TAADEL301A	Provide training through instruction and demonstration of work skills	BSZ404A	Train small groups	Not equivalent but better focussed on industry need and use.
TLID1007C	Operate a forklift	TDTD1097B	Operate a forklift	Equivalent

PMA08			Related unit in PMA02	
UEPOPS340A	Operate and Monitor a Steam Turbine	UTPNEG210A	Manage, operate and monitor turbine	Equivalent
UTPNEG167A	Operate and Monitor Gas Production Plant			New to PMA
		BSBCMN402A	Develop work priorities	Not carried forward
		BSBCMN404A	Develop teams and individuals	Not carried forward
		BSBCMN410A	Coordinate implementation of customer service strategies	Not carried forward
		BSBCMN412A	Promote innovation and change	Not carried forward
		BSBFLM402A	Show leadership in the workplace	Not carried forward
		BSBFLM403A	Manage effective workplace relationships	Not carried forward
		BSBFLM404A	Lead work teams	Not carried forward
		BSBFLM405A	Implement operational plan	Not carried forward
		BSBFLM406A	Implement workplace information system	Not carried forward
		BSBFLM409A	Implement continuous improvement	Not carried forward
		BSBFLM504A	Facilitate work teams	Not carried forward
		BSBFLM505A	Manage operational plan	Not carried forward

PMA08			Related unit in PMA02	
		BSBFLM509 A	Promote continuous improvement	Not carried forward
		BSBFLM510 A	Facilitate and capitalise on change and innovation	Not carried forward
		BSBFLM511 A	Develop a workplace learning environment	Not carried forward

PMA08v4 - List of PMA units of competency

Unit code	Unit title	Prerequisite
PMAOHS211B	Prepare equipment for emergency response	
PMAOHS213B	Undertake fire control and emergency rescue	
PMAOHS214B	Undertake helicopter safety and escape	
PMAOHS215B	Apply offshore facility abandonment and sea survival procedures	
PMAOHS221B	Maintain First Aid supplies and records	
PMAOHS310B	Investigate incidents	
PMAOHS311B	Lead emergency teams	
PMAOHS312B	Command the operation of survival craft	
PMAOHS320C	Provide advanced First Aid response	
PMAOHS321B	Provide First Aid response in remote and/or isolated area	
PMAOHS420B	Develop First Aid procedures and manage resources	
PMAOHS502B	Contribute to safety case	
PMAOHS511A	Manage emergency incidents	PMAOMIR320B

PMAOMIR210B	Control evacuation to muster point	
PMAOMIR301B	Undertake initial rescue	
PMAOMIR302B	Respond to a helideck incident	
PMAOMIR305A	Operate panel during an emergency	
PMAOMIR317B	Facilitate search and rescue operations	
PMAOMIR320B	Manage incident response information	
PMAOMIR321B	Manage communication systems during an incident	
PMAOMIR346B	Assess and secure an incident site	
PMAOMIR407B	Audit incident preparedness and established response system	
PMAOMIR418B	Coordinate incident response	
PMAOMIR424B	Develop and maintain community relationships	
PMAOMIR430B	Conduct and assess incident exercises	
PMAOMIR444B	Develop incident containment tactics	
PMAOMIR449B	Monitor legal compliance obligations during incidents	
PMAOMIR512B	Establish incident response preparedness and response systems	
PMAOMIR523B	Manage corporate media requirements in a crisis	
PMAOMIR575B	Coordinate welfare support activities in response to an incident	
PMAOMIR622B	Build partnerships to improve incident response capacity	
PMAOMIR650B	Manage a crisis	
PMAOPS101C	Read dials and indicators	
PMAOPS105C	Select and prepare materials	
PMAOPS201B	Operate fluid flow equipment	

PMAOPS202B	Operate fluid mixing equipment	
PMAOPS203B	Handle goods	
PMAOPS204B	Use utilities and services	
PMAOPS205B	Operate heat exchangers	
PMAOPS208B	Operate chemical separation equipment	
PMAOPS210B	Operate particulates handling equipment	
PMAOPS211B	Operate manufacturing extruders	
PMAOPS213B	Package product/material	
PMAOPS216B	Operate local control system	
PMAOPS217B	Operate wet milling equipment	
PMAOPS220B	Monitor chemical reactions in the process	
PMAOPS221B	Operate and monitor prime movers	
PMAOPS222B	Operate and monitor pumping systems and equipment	
PMAOPS223B	Operate and monitor valve systems	
PMAOPS224B	Provide fluids for utilities and support	
PMAOPS230B	Monitor, operate and maintain pipeline stations and equipment	
PMAOPS231B	Control gas odourisation	
PMAOPS232B	Produce product by filtration	
PMAOPS233A	Monitor wells and gathering systems	
PMAOPS234A	Monitor and operate low pressure compressors	
PMAOPS240B	Store liquids in bulk	
PMAOPS241A	Operate Joule-Thomson effect device	
PMAOPS242A	Moor ships for transfer of bulk processed particulates or fluids	

PMAOPS246A	Operate separation equipment	
PMAOPS247A	Operate powered separation equipment	
PMAOPS260A	Conduct screening operations	
PMAOPS261A	Operate bulk solids loading equipment	
PMAOPS262A	Operate digestion equipment	
PMAOPS263A	Operate leaching equipment	
PMAOPS264A	Operate solvent extraction equipment	
PMAOPS265A	Operate magnetic electrical separation equipment	
PMAOPS280B	Interpret process plant schematics	
PMAOPS290B	Operate a biotreater	
PMAOPS300B	Operate a production unit	
PMAOPS301B	Produce product by distillation	
PMAOPS302B	Operate reactors and reaction equipment	
PMAOPS303B	Operate furnaces to induce reaction	
PMAOPS304B	Operate and monitor compressor systems and equipment	
PMAOPS305B	Operate process control systems	
PMAOPS307B	Transfer bulk fluids into/out of storage facility	PMAOPS201 B
PMAOPS308B	Organise storage and logistics of general materials	
PMAOPS309B	Operate particulates handling/storage equipment	
PMAOPS312B	Undertake ship loading/unloading operations	
PMAOPS319A	Adjust batch	
PMAOPS320B	Conduct artificial lift	
PMAOPS321B	Undertake well management	

PMAOPS323A	Operate and monitor heating furnace	
PMAOPS324A	Operate a gas turbine	
PMAOPS325B	Generate electrical power	
PMAOPS326B	Produce product using gas absorption	
PMAOPS327B	Produce product using fixed bed dehydration	
PMAOPS329B	Produce product using liquid extraction	
PMAOPS330B	Communicate pipeline control centre operations	
PMAOPS333A	Operate wells and gathering systems	
PMAOPS335A	Conduct pipeline pigging	
PMAOPS340B	Operate cryogenic processes	
PMAOPS350B	Match and adjust colour	
PMAOPS360A	Operate a metalliferous kiln-furnace	
PMAOPS361A	Operate a smelting furnace	
PMAOPS362A	Operate a blast furnace	
PMAOPS364A	Operate an electrochemical process	
PMAOPS365A	Operate pelletising equipment	
PMAOPS366A	Operate sintering equipment	
PMAOPS390B	Operate a biochemical process	
PMAOPS402A	Respond to abnormal process situations	
PMAOPS405A	Operate complex control systems	
PMAOPS410B	Monitor remote production facilities	
PMAOPS411B	Manage plant shutdown and restart	
PMAOPS433A	Manage wells and gathering systems	
PMAOPS434A	Commission wells and gathering systems	
PMAOPS450B	Solve colour problems	

PMAOPS460A	Monitor and operate tailings management facility	
PMAOPS500A	Optimise production systems	
PMAOPS501A	Provide operational expertise to a project team	
PMAOPS505A	Control the process in abnormal situations	
PMAOPS511B	Determine energy transfer loads	
PMAOPS512B	Determine mass transfer loads	
PMAOPS520C	Manage utilities	
PMAOPS521C	Plan plant shutdown	
PMAOPS522A	Coordinate plant shut down	
PMAOPS550B	Develop a colour formulation	PMAOPS350 B PMAOPS450 B
PMAOPS560A	Plan and design tailings management facilities	
PMAOPS600C	Modify plant	
PMAOPS601A	Debottleneck plant	
PMAOPS751A	Apply physiochemical knowledge to select raw materials for surface coatings	
PMAOPS752A	Develop a decorative coating	
PMAOPS753A	Develop a non-decorative coating or ink	
PMAOPS755A	Provide surface coatings application advice	
PMASMELT260B	Form carbon anodes	
PMASMELT261B	Bake carbon anodes	
PMASMELT262B	Clean and strip anode rods	
PMASMELT263B	Spray carbon anodes	
PMASMELT264B	Start up reduction cells	

PMASMELT265B	Operate reduction cells	
PMASMELT266B	Deliver molten metal	
PMASMELT267B	Cast aluminium ingots	
PMASMELT268B	Vertical direct casting	
PMASMELT269A	Operate cell tending equipment	
PMASMELT270A	Supply product from reduction cells	
PMASUP236B	Operate vehicles in the field	
PMASUP237B	Undertake crane, dogging and load transfer operations	
PMASUP241B	Maintain pipeline easements	
PMASUP242B	Monitor pipeline civil works	
PMASUP243B	Monitor and maintain pipeline coatings	
PMASUP244A	Prepare and isolate plant	
PMASUP305A	Operate offshore cranes	
PMASUP311A	Operate communications hub	
PMASUP341B	Monitor and maintain instrument and control systems	
PMASUP342B	Monitor and maintain electrical systems	
PMASUP343B	Monitor and maintain cathodic protection systems	
PMASUP344B	Monitor and control repairs and modifications on operational pipe	
PMASUP345A	Monitor vibration	
PMASUP346A	Control corrosion	
PMASUP347A	Undertake corrosion inspection in a petrochemical environment	
PMASUP410B	Develop plant documentation	
PMASUP420B	Minimise environmental impact of process	

PMASUP432B	Coordinate pipeline projects	
PMASUP440B	Commission/recommission plant	
PMASUP441C	Decommission plant	
PMASUP444A	Plan plant preparation and isolation	
PMASUP445A	Participate in HAZOP studies	PMAOPS280 B
PMASUP520B	Review procedures to minimise environmental impact of process	
PMASUP540B	Analyse equipment performance	
PMASUP620B	Manage environmental management system	PMASUP520 B

PMA08v4 - Imported units of competency

Code	Title	Origin
FDFPH1001A	Follow work procedures to maintain Good Manufacturing Practice	Food Processing Industry Training Package (FDF10)
FDFPH2001A	Apply Good Manufacturing Practice procedures	Food Processing Industry Training Package (FDF10)
FDFPHGMP3A	Monitor the implementation of Good Manufacturing Practice procedures	Food Processing Industry Training Package (FDF10)
MEM05012C	Perform routine manual metal arc welding	Metal and Engineering Training Package (MEM05)
MEM07033B	Operate and monitor basic boiler	Metal and Engineering Training Package (MEM05)
MEM07034A	Operate and monitor intermediate class boiler	Metal and Engineering Training

		Package (MEM05)
MEM09002B	Interpret technical drawing	Metal and Engineering Training Package (MEM05)
MEM09003B	Prepare basic engineering drawing	Metal and Engineering Training Package (MEM05)
MEM11011B	Undertake manual handling	Metal and Engineering Training Package (MEM05)
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	Metal and Engineering Training Package (MEM05)
MEM18011C	Shut down and isolate machines/equipment	Metal and Engineering Training Package (MEM05)
MSACMT671A	Develop and manage sustainable environmental practices	Manufacturing Training Package (MSA07)
MSAENV272B	Participate in environmentally sustainable work practices	Manufacturing Training Package (MSA07)
MSAENV472B	Implement and monitor environmentally sustainable work practices	Manufacturing Training Package (MSA07)
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	Manufacturing Training Package (MSA07)
MSAPMOHS100A	Follow OHS procedures	Manufacturing Training Package (MSA07)
MSAPMOHS110A	Follow emergency response procedures	Manufacturing Training Package (MSA07)
MSAPMOHS200A	Work safely	Manufacturing Training Package (MSA07)

MSAPMOHS205A	Control minor incidents	Manufacturing Training Package (MSA07)
MSAPMOHS210B	Undertake first response to non-fire incidents	Manufacturing Training Package (MSA07)
MSAPMOHS212A	Undertake first response to fire incidents	Manufacturing Training Package (MSA07)
MSAPMOHS216A	Operate breathing apparatus	Manufacturing Training Package (MSA07)
MSAPMOHS217A	Gas test atmospheres	Manufacturing Training Package (MSA07)
MSAPMOHS220A	Provide initial First Aid response	Manufacturing Training Package (MSA07)
MSAPMOHS300A	Facilitate the implementation of OHS for a work group	Manufacturing Training Package (MSA07)
MSAPMOHS400A	Contribute to OHS management system	Manufacturing Training Package (MSA07)
MSAPMOHS401A	Assess risk	Manufacturing Training Package (MSA07)
MSAPMOHS503A	Maintain the workplace OHS management system	Manufacturing Training Package (MSA07)
MSAPMOHS510A	Manage risk	Manufacturing Training Package (MSA07)
MSAPMOHS601A	Establish workplace OHS management system	Manufacturing Training Package (MSA07)

MSAPMOPS100A	Use equipment	Manufacturing Training Package (MSA07)
MSAPMOPS102A	Perform tasks to support production	Manufacturing Training Package (MSA07)
MSAPMOPS200A	Operate equipment	Manufacturing Training Package (MSA07)
MSAPMOPS212A	Use organisation computers or data systems	Manufacturing Training Package (MSA07)
MSAPMOPS400A	Optimise process/plant area	Manufacturing Training Package (MSA07)
MSAPMOPS401A	Trial new process or product	Manufacturing Training Package (MSA07)
MSAPMOPS404A	Co-ordinate maintenance	Manufacturing Training Package (MSA07)
MSAPMOPS405A	Identify problems in fluid power system	Manufacturing Training Package (MSA07)
MSAPMOPS406A	Identify problems in electronic control systems	Manufacturing Training Package (MSA07)
MSAPMPER200C	Work in accordance with an issued permit	Manufacturing Training Package (MSA07)
MSAPMPER201A	Monitor and control work permits	Manufacturing Training Package (MSA07)
MSAPMPER202A	Observe permit work	Manufacturing Training Package (MSA07)

MSAPMPER205C	Enter confined space	Manufacturing Training Package (MSA07)
MSAPMPER300C	Issue work permits	Manufacturing Training Package (MSA07)
MSAPMPER400A	Coordinate permit process	Manufacturing Training Package (MSA07)
MSAPMSUP100A	Apply workplace procedures	Manufacturing Training Package (MSA07)
MSAPMSUP101A	Clean workplace or equipment	Manufacturing Training Package (MSA07)
MSAPMSUP102A	Communicate in the workplace	Manufacturing Training Package (MSA07)
MSAPMSUP106A	Work in a team	Manufacturing Training Package (MSA07)
MSAPMSUP172A	Identify and minimise environmental hazards	Manufacturing Training Package (MSA07)
MSAPMSUP200A	Achieve work outcomes	Manufacturing Training Package (MSA07)
MSAPMSUP201A	Receive or despatch goods	Manufacturing Training Package (MSA07)
MSAPMSUP204A	Pack products or materials	Manufacturing Training Package (MSA07)
MSAPMSUP205A	Transfer loads	Manufacturing Training Package (MSA07)

MSAPMSUP210A	Process and record information	Manufacturing Training Package (MSA07)
MSAPMSUP240A	Undertake minor maintenance	Manufacturing Training Package (MSA07)
MSAPMSUP280A	Manage conflict at work	Manufacturing Training Package (MSA07)
MSAPMSUP291A	Participate in continuous improvement	Manufacturing Training Package (MSA07)
MSAPMSUP292A	Sample and test materials and product	Manufacturing Training Package (MSA07)
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	Manufacturing Training Package (MSA07)
MSAPMSUP301A	Apply HACCP to the workplace	Manufacturing Training Package (MSA07)
MSAPMSUP303A	Identify equipment faults	Manufacturing Training Package (MSA07)
MSAPMSUP309A	Maintain and organise workplace records	Manufacturing Training Package (MSA07)
MSAPMSUP310A	Contribute to the development of plant documentation	Manufacturing Training Package (MSA07)
MSAPMSUP330A	Develop and adjust a production schedule	Manufacturing Training Package (MSA07)
MSAPMSUP382A	Provide coaching/mentoring in the workplace	Manufacturing Training Package (MSA07)

MSAPMSUP383A	Facilitate a team	Manufacturing Training Package (MSA07)
MSAPMSUP390A	Use structured problem solving tools	Manufacturing Training Package (MSA07)
MSAPMSUP400A	Develop and monitor quality systems	Manufacturing Training Package (MSA07)
MSL936001A	Maintain quality system and continuous improvement processes within work/functional area	Laboratory Operations Training Package (MSL09)
MSL952001A	Collect routine site samples	Laboratory Operations Training Package (MSL09)
MSL954001A	Obtain representative samples in accordance with sampling plan	Laboratory Operations Training Package (MSL09)
MSL973001A	Perform basic tests	Laboratory Operations Training Package (MSL09)
MSL976003A	Evaluate and select appropriate test methods and/or procedures	Laboratory Operations Training Package (MSL09)
MSL977001A	Contribute to the development of products and applications	Laboratory Operations Training Package (MSL09)
MSL977002A	Troubleshoot equipment and/or production processes	Laboratory Operations Training Package (MSL09)
MSL977004A	Develop or adapt analyses and procedures	Laboratory Operations Training Package (MSL09)
MSS402002A	Sustain process improvements	Sustainability Training Package (MSS11)

MSS402030A	Apply cost factors to work practices	Sustainability Training Package (MSS11)
MSS402031A	Interpret product costs in terms of customer requirements	Sustainability Training Package (MSS11)
MSS402040A	Apply 5S procedures	Sustainability Training Package (MSS11))
MSS402050A	Monitor process capability	Sustainability Training Package (MSS11)
MSS402051A	Apply quality standards	Sustainability Training Package (MSS11)
MSS402060A	Use planning software systems in operations	Sustainability Training Package (MSS11)
MSS402080A	Undertake root cause analysis	Sustainability Training Package (MSS11)
MSS402081A	Contribute to the application of a proactive maintenance strategy	Sustainability Training Package (MSS11)
MSS403002A	Ensure process improvements are sustained	Sustainability Training Package (MSS11)
MSS403011A	Facilitate implementation of competitive systems and practices	Sustainability Training Package (MSS11)
MSS403013A	Lead team culture improvement	Sustainability Training Package (MSS11)
MSS403030A	Improve cost factors in work practices	Sustainability Training Package (MSS11)

MSS403040A	Facilitate and improve implementation of 5S	Sustainability Training Package (MSS11))
MSS403041A	Facilitate breakthrough improvements	Sustainability Training Package (MSS11)
MSS403051A	Mistake proof an operational process	Sustainability Training Package (MSS11)
MSS404050A	Undertake process capability improvements	Sustainability Training Package (MSS11)
MSS404052A	Apply statistics to operational processes	Sustainability Training Package (MSS11)
MSS404060A	Facilitate the use of planning software systems in a work area or team	Sustainability Training Package (MSS11)
MSS404081A	Undertake proactive maintenance analyses	Sustainability Training Package (MSS11)
MSS404082A	Assist in implementing a proactive maintenance strategy	Sustainability Training Package (MSS11)
MSS405010A	Manage relationships with non-customer external organisations	Sustainability Training Package (MSS11)
MSS405011A	Manage people relationships	Sustainability Training Package (MSS11)
MSS405012A	Manage workplace learning	Sustainability Training Package (MSS11)
MSS405030A	Optimise cost of a product or service	Sustainability Training Package (MSS11)

MSS405031A	Undertake value analysis of product or process costs in terms of customer requirements	Sustainability Training Package (MSS11)
MSS405040A	Manage 5S system in an organisation	Sustainability Training Package (MSS11)
MSS405041A	Implement improvement systems in an organisation	Sustainability Training Package (MSS11)
MSS405050A	Determine and improve process capability	Sustainability Training Package (MSS11)
MSS405060A	Develop the application of enterprise control systems in an organisation	Sustainability Training Package (MSS11)
MSS405061A	Determine and establish information collection requirements and processes	Sustainability Training Package (MSS11)
MSS405070A	Develop and manage sustainable energy practices	Sustainability Training Package (MSS11)
MSS405081A	Develop a proactive maintenance strategy	Sustainability Training Package (MSS11)
NWP357B	Monitor, operate and control reverse osmosis and nano-filtration processes	Water Training Package (NWP07)
PSPGOV308B	Work effectively with diversity	Public Sector Training Package (PSP04)
PSPMNGT604B	Manage change	Public Sector Training Package (PSP04)
PSPMNGT605B	Manage diversity	Public Sector Training Package (PSP04)
RIIOHS204A	Work safely at heights	Resources and Infrastructure

		Industry Training Package (RII09)
TAEASS301B	Contribute to assessment	Training and Education (TAE10)
TAEASS401B	Plan assessment activities and processes	Training and Education (TAE10)
TAEASS402B	Assess competence	Training and Education (TAE10)
TAEASS403B	Participate in assessment validation	Training and Education (TAE10)
TAEDEL301A	Provide work skill instruction	Training and Education (TAE10)
TLID2010A	Operate a forklift	Transport and Logistics Training Package (TLI10)
UEPOPS319B	Operate and monitor gas production plant	Electricity Supply Industry - Generation Sector Training Package (UEP06)
UEPOPS340B	Operate and monitor a steam turbine	Electricity Supply Industry - Generation Sector Training Package (UEP06)

Overview

What is a Training Package?

A Training Package is an integrated set of nationally endorsed competency standards, assessment guidelines and Australian Qualifications Framework (AQF) qualifications for a specific industry, industry sector or enterprise.

Each Training Package:

- provides a consistent and reliable set of components for training, recognising and assessing people's skills, and may also have optional support materials
- enables nationally recognised qualifications to be awarded through direct assessment of workplace competencies

- encourages the development and delivery of flexible training which suits individual and industry requirements encourages learning and assessment in a work-related environment which leads to verifiable workplace outcomes.

How do Training Packages fit within the National Skills Framework?

The National Skills Framework applies nationally, is endorsed by the Ministerial Council for Vocational and Technical Education, and comprises the Australian Quality Training Framework 2007 (AQTF 2007), and Training Packages endorsed by the National Quality Council (NQC).

How are Training Packages developed?

Training Packages are developed by Industry Skills Councils or enterprises to meet the identified training needs of specific industries or industry sectors. To gain national endorsement of Training Packages, developers must provide evidence of extensive research, consultation and support within the industry area or enterprise.

How do Training Packages encourage flexibility?

Training Packages describe the skills and knowledge needed to perform effectively in the workplace without prescribing how people should be trained.

Training Packages acknowledge that people can achieve vocational competency in many ways by emphasising what the learner can do, not how or where they learned to do it. For example, some experienced workers might be able to demonstrate competency against the units of competency, and even gain a qualification, without completing a formal training program.

With Training Packages, assessment and training may be conducted at the workplace, off-the-job, at a training organisation, during regular work, or through work experience, work placement, work simulation or any combination of these.

Who can deliver and assess using Training Packages?

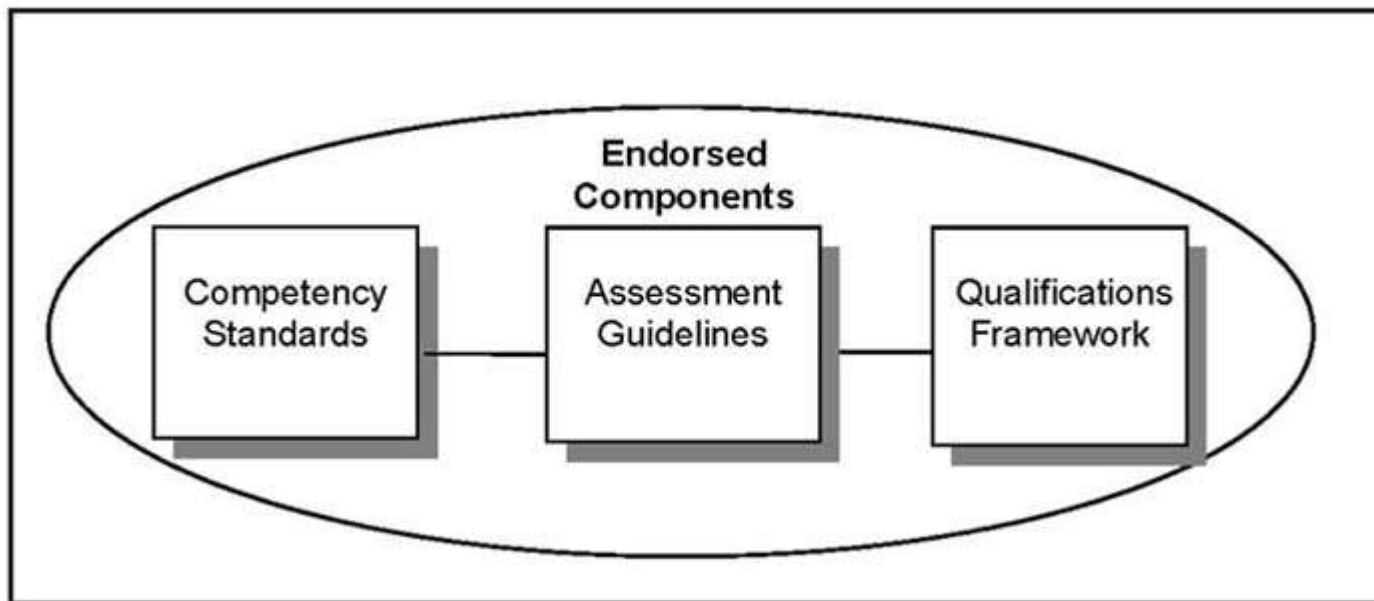
Training and assessment using Training Packages must be conducted by a Registered Training Organisation (RTO) that has the qualifications or specific units of competency on its scope of registration, or that works in partnership with another RTO, as specified in the AQTF 2007.

Training Package Components

Training Packages are made up of mandatory components endorsed by the NQC, and optional support materials.

Training Package Endorsed Components

The nationally endorsed components include the Competency Standards, Assessment Guidelines and Qualifications Framework. These form the basis of training and assessment in the Training Package and, as such, they must be used.



Competency Standards

Each unit of competency identifies a discrete workplace requirement and includes the knowledge and skills that underpin competency as well as language, literacy and numeracy; and occupational health and safety requirements. The units of competency must be adhered to in training and assessment to ensure consistency of outcomes.

Assessment Guidelines

The Assessment Guidelines provide an industry framework to ensure all assessments meet industry needs and nationally agreed standards as expressed in the Training Package and the AQTF 2007. The Assessment Guidelines must be followed to ensure the integrity of assessment leading to nationally recognised qualifications.

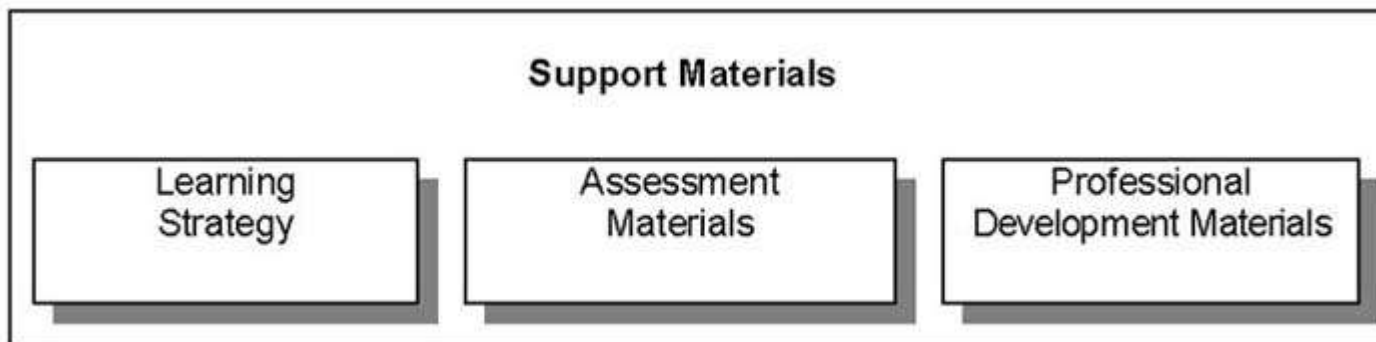
Qualifications Framework

Each Training Package provides details of those units of competency that must be achieved to award AQF qualifications. The rules around which units of competency can be combined to make up a valid AQF qualification in the Training Package are referred to as the "packaging rules". The packaging rules must be followed to ensure the integrity of nationally recognised qualifications issued.

Training Package Support Materials

The endorsed components of Training Packages are complemented and supported by optional support materials that provide for choice in the design of training and assessment to meet the needs of industry and learners.

Training Package support materials can relate to single or multiple units of competency, an industry sector, a qualification or the whole Training Package. They tend to fall into one or more of the categories illustrated below.



Training Package support materials are produced by a range of stakeholders such as RTOs, individual trainers and assessors, private and commercial developers and Government agencies.

Where such materials have been quality assured through a process of "noting" by the NQC, they display the following official logo. Noted support materials are listed on the National Training Information Service (NTIS), together with a detailed description and information on the type of product and its availability < www.ntis.gov.au >



It is not compulsory to submit support materials for noting; any resources that meet the requirements of the Training Package can be used.

Training Package, Qualification and Unit of Competency Codes

There are agreed conventions for the national codes used for Training Packages and their components. Always use the correct codes, exactly as they appear in the Training Package, and with the code always before the title.

Training Package Codes

Each Training Package has a unique five-character national code assigned when the Training Package is endorsed, for example PMA08. The first three characters are letters identifying the Training Package industry coverage and the last two characters are numbers identifying the year of endorsement.

Qualification Codes

Within each Training Package, each qualification has a unique eight-character code, for example PMA20108. Qualification codes are developed as follows:

- the first three letters identify the Training Package;
- the first number identifies the qualification level (noting that, in the qualification titles themselves, arabic numbers are not used);

- the next two numbers identify the position in the sequence of the qualification at that level; and
- the last two numbers identify the year in which the qualification was endorsed. (Where qualifications are added after the initial Training Package endorsement, the last two numbers may differ from other Training Package qualifications as they identify the year in which those particular qualifications were endorsed.)

Unit of Competency Codes

Within each Training Package, each unit of competency has a unique code. Unit of competency codes are assigned when the Training Package is endorsed, or when new units of competency are added to an existing endorsed Training Package. Unit codes are developed as follows:

- a typical code is made up of 12 characters, normally a mixture of uppercase letters and numbers, as in PMAOHS511A;
- the first three characters signify the Training Package - PMA08 - in the above example and up to eight characters, relating to an industry sector, function or skill area, follow;
- the last character is always a letter and identifies the unit of competency version. An "A" at the end of the code indicates that this is the original unit of competency. "B", or another incremented version identifier means that minor changes have been made. Typically this would mean that wording has changed in the range statement or evidence guide, providing clearer intent; and
- where changes are made that alter the outcome, a new code is assigned and the title is changed.

Training Package, Qualification and Unit of Competency Titles

There are agreed conventions for titling Training Packages and their components. Always use the correct titles, exactly as they appear in the Training Package, and with the code always placed before the title.

Training Package Titles

The title of each endorsed Training Package is unique and relates the Training Packages broad industry coverage.

Qualification Titles

The title of each endorsed Training Package qualification is unique. Qualification titles use the following sequence:

- first, the qualification is identified as either Certificate I, Certificate II, Certificate III, Certificate IV, Diploma, Advanced Diploma, Vocational Graduate Certificate, or Vocational Graduate Diploma;
- this is followed by the words "in" for Certificates I to IV, and "of" for Diploma, Advanced Diploma, Vocational Graduate Certificate and Vocational Graduate Diploma;
- then, the industry descriptor, for example Telecommunications; and
- then, if applicable, the occupational or functional stream in brackets, for example (Computer Systems).

For example:

- PMA20108 Certificate II in Process Plant Operations

Unit of Competency Titles

Each unit of competency title is unique. Unit of competency titles describe the competency outcome concisely, and are written in sentence case.

For example:

- PMAOHS211B Prepare equipment for emergency response

Development of PMA08v2

As part of MSA's Continuous Improvement Plan, Kevin Hummel of Total Training and Performance Solutions (TaPS) was commissioned to undertake minor changes to PMA08. Industry users had noted that:

- the new area of coal seam gas gathering and processing required some additional skills to those currently in PMA08
- there was a gap in the cryogenic processing skills in the area of Joule-Thomson devices. MSA supported the development of these new units of competency.

Industry drivers for change

The major industry drivers for the improvements to PMA08 Chemical, Hydrocarbons and Refining Training Package are outlined below.

- Coal seam gas (CSG) is a new and rapidly growing subsector within the hydrocarbons sector of PMA. The Queensland Government estimates that CSG may employ an additional 18 000 persons, most of whom will be new to the sector. It is important that formal training and qualification be available for the entrants to this dynamic new subsector of the upstream hydrocarbons sector.
- Liquefied natural gas (LNG) and the liquefaction of aerolean gases are established subsectors of growing importance, particularly the growth in LNG. While this subsector is already largely covered by PMA08 Chemical, Hydrocarbons and Refining Training Package, it was identified that one critical process was not currently covered (the operation of a Joule-Thomson device) and so this needed to be addressed. Again this was brought into a sharp focus by the growth of this downstream hydrocarbons sector

Development of PMA08 version 1

PMA98

The original Chemical, Hydrocarbons and Oil Refining Training Package was developed by Manufacturing Learning Australia (MLA), the national ITAB, with funding provided by the Australian National Training Authority (ANTA). The development was done by Total Training and Performance Solutions (TaPS) during the second half of 1997. The Training Package was endorsed early in 1998.

PMA02 - Version 1

The review, undertaken by MLA, occurred in two stages. Phase I of the review to determine the strengths and weaknesses of PMA98 and the scope of revisions needed was conducted from May to October 2000. The Phase II review (conducted by TaPS) commenced in August

2001 and was concluded in July 2002.

The review was held in the 'post Longford' environment. This had a serious impact on the emphases of the industry, particularly those in Victoria where many were expending significant effort to develop their safety case as required under the new major hazard facility regulations. In addition to this the States had generally just introduced new OHS legislation and regulations requiring a risk management approach to health and safety. This was a major factor and led to the incorporation of an element on controlling hazards in each OPS unit.

The industry steering committee contained a wide spread of both industry and RTO representation, as well as STA and ITAB representation. It contributed to the design of the reviewed Training Package as well as providing critical feedback on all components.

PMA02 - Version 2

One issue which became clear during the review which lead to PMA02 was that units of competency related to incident preparedness and response were not well handled in the PMA Training Package and that units from the Public Safety Training Package which on the face of it might be appropriate were a very poor fit for this industry and there was a total lack of units in some areas. This led to MLA mounting the 'Off shore and Major hazard facility Incident Response (OMIR) project, conducted by Training and Assessment Services (TAS) and resulted in the creation of a suite of units (generally including 'OMIR' in the code) which were then incorporated into PMA02. The industry did not seek any specific qualifications relating to these units, preferring to concentrate on the competencies. This project was completed in 2004. Some other consequent changes were made to existing OHS units to ensure they matched the new OMIR units.

Version 3 - Aluminium Smelting

Due to an industry request to modify PMA02 to also cover the technical skills required in aluminium smelting, a small project was funded in late 2005 by Manufacturing Skills Australia (MSA - the Industry Skills Council with coverage of PMA). The development was undertaken by TaPS and the new units of competency completed by mid 2006. Due to some dislocations in the national VET system these units were not endorsed for incorporation into PMA02 until mid 2007.

PMA08 Chemical, Hydrocarbons and Refining Training Package

The scheduled review of PMA02 by MSA commenced early in 2006 with MSA conducting the Phase 1 Review, commencing late 2006. Again TaPS conducted the Phase 2 Review. This part of the review, due to some dislocations in the national VET system, was suspended for a period, finally recommencing in the second half of 2007 with the work being completed towards the end of 2007.

Consultations focussed on specific issues raised both during the Phase 1 Review and other issues identified during the development period. The main vehicle for consultation was specific 'Interest Groups' formed to address these specific issues. Membership of interest groups was predominantly industry personnel who responded to a general email to the MSA database asking for people with interest and expertise in the specific issue. Two special purpose 'interest groups' (one east coast and one west coast) were also held with assistance from State ITABs for RTOs in this sector, primarily to examine packaging rules and other related issues.

These interest groups led to the development of some new units of competency, an attempt to restructure the Certificate IV (ultimately unsuccessful) and a restructuring of the Diploma and the Advanced Diploma.

While these working groups were small and specific, broader general consultation was encouraged both by placing all drafts on the MSA web site and by emails to the general data base advising of progress and the availability of drafts. Drafts were also sent to interested parties directly on request.

This concentration on electronic consultation allowed the broadest participation by industry personnel in an industry where employment is often remote and off shore, and shifts may be 3 weeks on and 3 weeks off. Input was received from people working off shore and even in Papua New Guinea where they are using PMA. The email trail also ensured comments were not lost. This was important due to work being placed on hold in the middle of the project.

The review also occurred during a major rationalisation project being undertaken by MSA.

This saw many units of competency which had previously been 'owned' by PMA move into the generic Manufacturing Training Package (MSA07). This has increased the number of imported units of competency as many units which would normally have resided in PMA are now sourced from the general banks in MSA07.

Similarly, MLA and subsequently MSA had been attempting for many years to rationalise the three 'support qualifications' in the three process manufacturing Training Packages (PMA, PMB and PMC). The development of MSA07 finally allowed this to occur, resulting in nine very similar qualifications being reduced to three.

At the same time, it was recognised that the 'technical' Certificate I in PMA was in reality not a technical qualification and it was agreed it also could be replaced by MSA10207. This has resulted in four essentially duplicated qualifications in PMA02 not being carried forward.

As a result of a specific approach by the surface coatings industry, a Vocational Graduate Certificate has been developed in PMA08. This history of this particular qualification can be traced back 30 years or more. It has always been an industry run qualification, first by OCCA (Oil and Colour Chemists Association) and more recently by SCAA (Surface Coatings Association of Australia - an updated OCCA). While TAFE facilities have been used to deliver the course and qualifications, industry has provided most of the lecturers and also encouraged the students to enrol. With the move to competency based qualifications, it was essential to update the course structure and to develop appropriate units of competency. Industry representatives developed the units of competency (with some guidance and editing by TaPS) and an appropriate qualification structure was created. This has always been a national course and its inclusion in PMA08 will help it maintain and grow its national importance and enrolment. There are already existing industry developed learning resources to support individual learning should participants wish to learn that way.

The project reference group (PRG)

The project was overseen by a group of technical experts (RTOs and industry) who contributed much time and expertise to this project and their contribution is gratefully acknowledged. The PRG members were:

- Don Sanders (Chair, APPEA)
- David Graham (Huntsman)

- Lina Dickins - Lina was later replaced by Ken Rhodes (Santos)
- Keith Butler (Gladstone TAFE, representing Peter Cloughton [manager])
- Joe Calabrese (Agility) - Joe later retired and was replaced by Kim Peterson, TAFE NSW
- Gerald Crawford (DEST)
- Derek Cupp (MISAC [SA ITAB])
- Vince Lloyd (Qenos - AWU)
- John Lamont (Nowra Chemicals)
- Celeste Howden (MLA)
- Brenda Micale (DET WA)

Sherelee Rose (DFEEST, SA) also attended one meeting.

The industry participants

Many people made time in their busy schedule to participate in this project. Without their expertise and input, the project would not have been able to achieve its objectives and this is also gratefully acknowledged.

The industry also made available resources for meetings (including catering) and provided examples of their resources to assist in the development of new and revised units of competency. Their assistance is gratefully acknowledged.

Imprint Oct 24

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Summary of changes resulting from the review

Environmental changes

The review of PMA02 occurred in an environment of rationalisation and as a step towards laying the foundation for ongoing continuous improvement. There had been some significant changes in the broader Training Package environment since the last review of PMA02, including:

- development and endorsement of MCM04 Competitive Manufacturing
- development and endorsement of MSA07 Manufacturing
- introduction of Vocational Graduate Certificates and Diplomas
- introduction of Skill Sets.

In addition to these changes in the VET scene the industry's use of PMA was increasing and maturing with most of the majors now accepting Certificate II and/or III as a basic qualification for their plant operators/technicians and with a significant body of plant technicians now looking at the Certificate IV and Diploma.

Change of name to 'Chemical, Hydrocarbons and Refining'

To add to the texture of the PMA environment, Australian companies with operations overseas, and individual Australians working overseas are now beginning to seek access to this Australian suite of qualifications.

In addition, industry sectors which had previously been covered by PMA, but which had not actively participated in previous reviews were now also actively involved and these include aluminium smelting and alumina refining and the surface coatings (paint) sectors.

The review also occurred in the midst of a resources led boom. This led to a high state of activity among the industry participants and if anything increased the already high mobility between organisations for hydrocarbon companies.

In keeping with this extension of focus of PMA, and after much deliberation, it was decided that by simply removing 'Oil' from the name resulted in a title that covered the refining of minerals, which is a growing sector for PMA. Industry stakeholders agreed that as the 'oil refining' sector is actually seen as part of 'hydrocarbons', the new name provides a more inclusive title, without loss of the good will and recognition associated with the previous name.

Changes to qualifications in PMA08

PMA02 provided a range of both 'technical' and non-technical or 'support' qualifications. These had an integrated vertical structure, with some facility for moving between technical and support qualifications.

PMA08 only retains the technical qualifications within its structure. The non-technical PMA02 Certificates I, II and III in Process Support have not been carried forward (see below re the rationalised process manufacturing support qualifications available in MSA07).

Certificate I in Process Plant Skills has not been carried forward. In reality, this certificate was not a technical certificate and it is agreed that where there is a workplace need for a Certificate I, the generic MSA10207 Certificate I in Process Manufacturing is an appropriate qualification, with a similar selection of units.

The Certificates II, III and IV remain essentially unchanged, although there are some additional units.

The Diploma has been restructured to remove the implicit assumption in PMA50102 that the previous Certificates had also been achieved. People with the Certificate IV may achieve some advanced standing depending on the units selected. The structure has been chosen to keep the increment between Certificate IV and Diploma approximately constant.

The Advanced Diploma builds on the Diploma as is currently the case.

Changes to layout of PMA08 qualifications

'Units are now shown in 'banks' in the qualifications framework. This change in format is intended to reduce the confusion which sometimes arose from the PMA02 format. It is also consistent with the format used for other manufacturing Training Packages.

In PMA08, the banks are as follows:

- Group 1 units are the mandatory units (previously called 'core' units)

- Group 2 units are the technical units (previously called 'OPS' or 'operations' units)
- Group 3 units are the support units, and typically will be split into:
 - Group 3A: support units introduced for the qualification and that level
 - Group 3B: support and technical units which may be used for that qualification level but have been available for qualifications at lower levels.

The overall structure and principles of the packaging rules have not changed.

Relocation of support qualifications

Previous reviews of the process manufacturing Training Packages have attempted to rationalise the three support qualifications provided by PMA, PMB and PMC. The creation of MSA07 has allowed this to occur. The three support qualifications (PMA10202, PMA20202 and PMA30202) have not been carried forward into PMA08. These qualifications have been rationalised and moved into MSA07 for use across all of process manufacturing. These qualifications now access a broader range of units, and provide continued access to a similar range of units as in PMA02.

Certificate I

As noted above, PMA10102 Certificate I in Process Plant Skills has also been replaced by MSA10207 in recognition of its role as a non-technical qualification. Appropriate technical units may still be chosen for those wishing to use it as a first step towards PMA20108

Certificate II in Process Plant Operations. While this is not common for the workforces of the major Australian companies, it is still an important route for some to enter formal qualifications.

Addition of a Vocational Graduate Certificate

Advantage has been taken of the new availability of Vocational Graduate Certificates to take an accredited course which has had strong industry support for over 30 years and bring it within the Training Package environment. This has led to PMA70108 Vocational Graduate Certificate in Surface Coating Technology.

Skill Sets

Given the emphasis on safety and incident preparedness/response across the PMA sectors, the industry has supported the inclusion of a range of Skill Sets in PMA08. These have been created to address specific and ongoing training needs.

Transition arrangements

People with existing qualifications from PMA98 or PMA02 will still have that qualification recognised.

People who have some units of competency recognised (while not having a full qualification) should have the equivalent unit of competency in PMA08 granted and then be assessed for the relevant qualification under PMA08.

People who have enrolled in a course under PMA02 should consult the State Training Authority rules that apply in their State. Typically these will allow a 'phase out' period for the completion of the existing qualification before compulsorily moving them to the PMA08 qualification.

It is not expected that moving to the PMA08 qualification should cause any disadvantage.

Changes to units of competency

New units

There have been some additional units created where the industry had perceived some gaps, or to provide appropriate units for a newly active sector.

Rationalisation

Whereas PMA02 mainly used its own 'native' support units, PMA08 predominantly uses support units drawn from MSA07. This then provides common support units across PMA, PMB and PMC and eventually across a broader range of manufacturing Training Packages. This is expected to facilitate the creation of better resources in somewhat thin markets and to assist RTOs operating across the sectors to have more efficient delivery and assessment tools.

This move is also expected to allow industry a wider choice of units. While the rationalisation process has removed duplicated units, it has also made available more units in total from which to choose.

Prerequisites in PMA08

All prerequisites have been reassessed as part of the review of PMA02. The advice from stakeholders was that with the increase in sectors accessing PMA, unnecessary prerequisites restrict the flexibility of application of a unit of competency.

The prerequisites in PMA08 have been determined on the basis that it is considered essential that the proposed prerequisite unit be gained BEFORE commencing the unit in question. Where this is not necessary, the prerequisite units have been removed.

Competitive Manufacturing

A significant set of units has been imported from the Competitive Manufacturing suite of units recently placed in MSA07v3. This is expected to help industry access units which are better focussed on leading edge manufacturing practice. As a consequence the older Front Line Management units have not been formally imported (although are still available for importation under the importation rules). While industry had used these units, usually in highly contextualised form, the information provided during the review indicated it would be more appropriate to replace them with Competitive Manufacturing units.

Coding issues

The PMA specific technical and support units retain the PMA prefix.

Most support units, and some technical units now come with the MSAPM code indicating they are process manufacturing units drawn from MSA07.

Structure of units

Technical units in PMA02 usually had both an element on hazard control and an element on problem solving. Review of these units showed that this had led to some inadvertent repetition within the units. As working safely and solving problems is an integral part of the job and of competency in any unit, these elements have generally been integrated back into the other elements of the unit.

This is not seen as weakening the emphasis on either of these two aspects, but rather of better placing it in the context of it being part of everything that is done.

TAA units

As the BSZ training and assessment units have been withdrawn and are no longer available for importation to a Training Package, they have been replaced with the TAA units required to become a workplace assessor. Only those units required to be a qualified workplace assessor have been included. The other units leading to the Certificate IV have not been included.

Note people with the existing BSZ units are not required to retrain to the TAA units to continue assessing (unless they are assessing the TAA units). Please consult the ATQF2007 for details.

Two Certificate III units have also been imported, on industry advice, for those not requiring the full assessor qualification of three TAA units.

Assessment Guidelines

The Assessment Guidelines are the current version provided by DEEWR. The industry specific section provides similar information to that provided in PMA02.

Introduction to the Industry

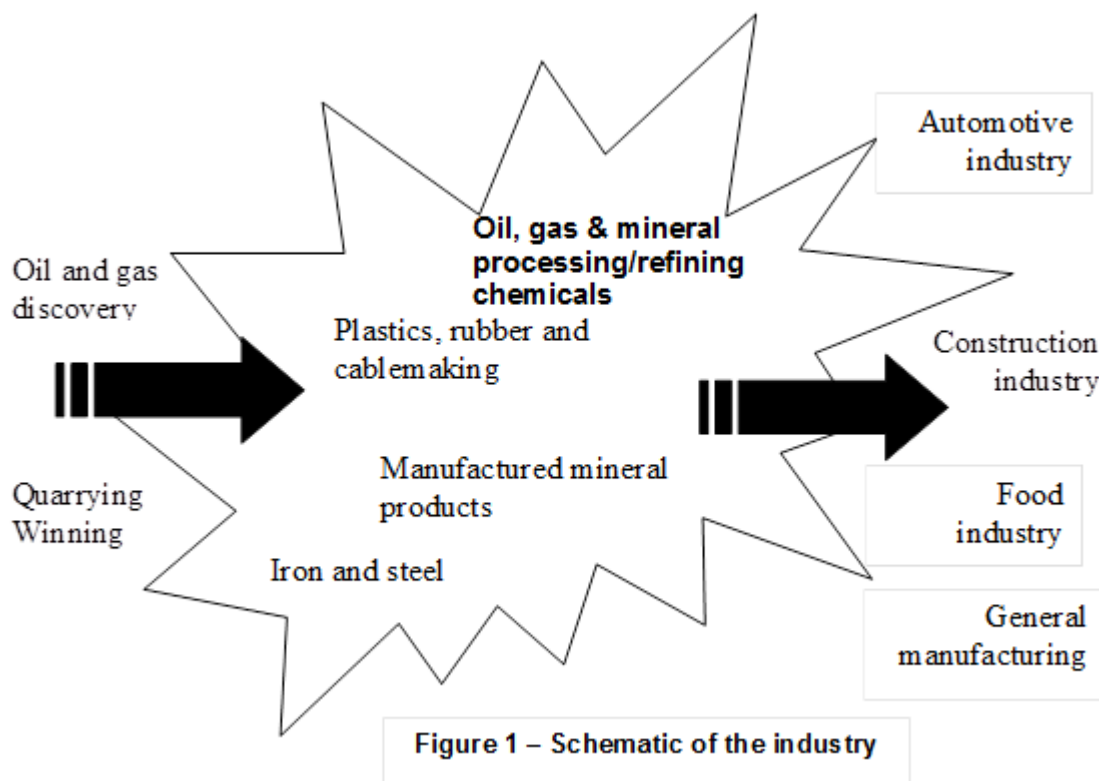
The process manufacturing industry

The process manufacturing industries include the major industry sectors of:

- chemical, hydrocarbons, and minerals processing and oil refining (ANZSIC classification 12 and 251 to 254) represented by PMA08 Training Package
- iron and steel (ANZSIC classification 271) – currently no Training Package
- manufactured mineral products (statistically the non-metallic minerals sector ANZSIC classification 26) represented by PMC04 Training Package
- plastics, rubber and cabling (ANZSIC classifications 255 and 2852) represented by PMB07 Training Package.

Many units of competency also reside in the general manufacturing Training Package MSA07.

The process manufacturing industries have common boundaries with the extractive industries (Mining and Drilling Training Packages) on the upstream end and the automotive, general manufacturing, building and construction and food and beverage industries on the downstream end (as shown in figure 1).



Process manufacturing is a sector within the Manufacturing industry. The manufacturing industry as a whole saw a growth of 8% in industry value added, 5% in wages and salaries and

employment growth of 2%(2004/05). Manufacturing as a whole contributed 12.4% of the national GDP in 2005/06 – second only to the services sector and over twice the contribution of the next sector – mining.

The industry naturally overlaps with the supporting and service industries such as maintenance trades (Metal and Engineering Training Package), administration (Business Services Training Package), sales and marketing (Wholesale and Retail Training Packages) and the professional areas of technical and management support.

In reality, of course, the boundaries are not as neat and tidy as this implies. Some companies belong in multiple sectors and have a production workforce spanning more than one Training Package and even more than one ISC. These companies may find the process manufacturing qualifications in MSA07 suitable to their entire workforce.

The process manufacturing sector as a total represents:

- 160 000 workers (representing 15% of all manufacturing)
- \$10 000 000 000 in wages and salaries paid (representing 21% of all manufacturing)
- \$105 000 000 000 of sales and service income (representing 31% of all manufacturing)
- \$25 500 000 000 value added (representing 26% of all manufacturing)
- \$159 000 value added per person (compared to all manufacturing of \$92 000 per person).

(All statistics in this sector are drawn from ABS 8221.0, Manufacturing Industry, 2004 – 05, released 2006).

The three process manufacturing sectors

The three process manufacturing Training Packages are:

- PMA08 Chemical, Hydrocarbons and Refining (this Training Package) – covering ANZSIC 25, 251 – 254, 2721 – 2722,
- PMB07 Plastic, Rubber and Cablemaking – covering ANZSIC 255 – 256, 2852
- PMC04 Manufactured Mineral Products – covering ANZSIC 26

Steel is not represented by a Training Package.

The chemical, hydrocarbons and refining industry

This industry sector is downstream to the minerals and hydrocarbons exploration and drilling and mineral mining sectors and commences once a production well/mine is established. Its products are distributed to the downstream processing plants as well as the utilities industry, other manufacturing and food and beverage sectors. Other sectors will start with raw materials such as common salt, sulphur or starch to produce their products. Most products from this industry are not used directly by the consumer but rather are transformed by downstream industries such as plastics, food and clothing into consumer products. The major exceptions to

this rule would be oil refinery products (petrol and lube oil) and paint.

This sector as a whole (in 2004-05):

- employed 224 486 persons (21% of manufacturing)
- paid wages and salaries of \$13 174 M (27% of manufacturing)
- made sales and service income of \$144 648M (43% of manufacturing)
- added value of \$32 224M (33% of manufacturing)

These figures include all those in the sector, not just those employees who might be covered by PMA08.

Historical and General Information

PMA08v4 - Metalliferous processing

Project background

The PMA08 Chemical, Hydrocarbons and Refining Training Package has always had coverage of the metalliferous processing sector, but due to a range of historical factors this sector was not as well represented in the Training Package as it should have been. The metalliferous processing project aimed to redress this historic deficiency.

When Total Training and Performance Solutions (TaPS) undertook a Scoping Project in 2011 it found that the PMA08 Chemical, Hydrocarbons and Refining Training Package and PMC10 Manufactured Mineral Products Training Packages between them have many units which are relevant to the metalliferous processing sector, but there are also obvious gaps in coverage while some existing units are only an approximate fit for this sector. The metalliferous processing project then went further, making recommendations regarding additional units and changes to existing units which will be required within PMA08 Chemical, Hydrocarbons and Refining Training Package to thoroughly cover this sector. This work also involved PMC10 Manufactured Mineral Products units to a greater or lesser extent.

PMA08 Chemical, Hydrocarbons and Refining Training Package has a natural, overlapping, boundary with RII09 Resources and Infrastructure Industry Training Package in the metalliferous processing sector. However, scoping found that although RII09 Resources and Infrastructure Industry Training Package has units covering most of this sector, they would appear to have a different design philosophy to PMA08 Chemical, Hydrocarbons and Refining Training Package both with regard to the units and the packaging into qualifications. So, while importing some RII09 Resources and Infrastructure Industry Training Package units may have been appropriate, the importation of many units would cause distortions within PMA08 Chemical, Hydrocarbons and Refining Training Package. Skills DMC (the skills council responsible for RII09) were advised of this project.

The industry sector supported the findings and MSA contracted TaPS to develop the new and revised units for inclusion in existing qualifications in PMA08 Chemical, Hydrocarbons and Refining Training Package.

PMA08v3 – Background

Project background

As part of MSA's Continuous Improvement Plan, Kevin Hummel of Total Training and Performance Solutions (TaPS) was commissioned to undertake these minor changes to the Chemical, Hydrocarbons and Refining Training package (PMA08). The industry users of PMA08 had noted that:

- the new area of coal seam gas gathering and processing required some additional skills to those currently in PMA08
- there was a gap in the plant preparation and isolation area which applies broadly across the sector.

MSA supported the development of these new units of competency. Expert technical groups were then established to inform the development work, which commenced in September 2010. Further industry consultations were undertaken as part of developing and validating a detailed specification for the new units of competence and their insertion into the relevant qualifications.

Industry drivers for change

The major industry drivers for the improvements to this package are outlined below:

- Coal seam gas (CSG) is a new and rapidly growing subsector within the hydrocarbons sector of PMA. The Queensland Government estimates that CSG may employ an additional 18 000 persons, most of whom will be new to the sector. It is important that formal training and qualification be available for the entrants to this dynamic new subsector of the upstream hydrocarbons sector.
- Plant preparation and isolation has been previously covered within each technical unit of competency as relevant to that unit operation. The industry expressed a view that this did not allow for the development of the competency to apply best practice preparation and isolation principles to plants as a whole and each unit operation in its relationship to the plant. These new units complement the existing elements addressing isolation and preparation.

Development of PMA08v2

As part of MSA's Continuous Improvement Plan, Kevin Hummel of Total Training and Performance Solutions (TaPS) was commissioned to undertake minor changes to PMA08. Industry users had noted that:

- the new area of coal seam gas gathering and processing required some additional skills to those currently in PMA08
- there was a gap in the cryogenic processing skills in the area of Joule-Thomson devices.

MSA supported the development of these new units of competency.

Industry drivers for change

The major industry drivers for the improvements to PMA08 Chemical, Hydrocarbons and Refining Training Package are outlined below.

- Coal seam gas (CSG) is a new and rapidly growing subsector within the hydrocarbons sector of PMA. The Queensland Government estimates that CSG may employ an additional 18 000 persons, most of whom will be new to the sector. It is important that formal training and qualification be available for the entrants to this dynamic new subsector of the upstream hydrocarbons sector.

Liquefied natural gas (LNG) and the liquefaction of aerolean gases are established subsectors of growing importance, particularly the growth in LNG. While this subsector is already largely covered by PMA08 Chemical, Hydrocarbons and Refining Training Package, it was identified that one critical process was not currently covered (the operation of a Joule-Thomson device) and so this needed to be addressed. Again this was brought into a sharp focus by the growth of this downstream hydrocarbons sector

Development of PMA08 version 1

PMA98

The original Chemical, Hydrocarbons and Oil Refining Training Package was developed by Manufacturing Learning Australia (MLA), the national ITAB, with funding provided by the Australian National Training Authority (ANTA). The development was done by Total Training and Performance Solutions (TaPS) during the second half of 1997. The Training Package was endorsed early in 1998.

PMA02 – Version 1

The review, undertaken by MLA, occurred in two stages. Phase I of the review to determine the strengths and weaknesses of PMA98 and the scope of revisions needed was conducted from May to October 2000. The Phase II review (conducted by TaPS) commenced in August 2001 and was concluded in July 2002.

The review was held in the ‘post Longford’ environment. This had a serious impact on the emphases of the industry, particularly those in Victoria where many were expending significant effort to develop their safety case as required under the new major hazard facility regulations. In addition to this the States had generally just introduced new OHS legislation and regulations requiring a risk management approach to health and safety. This was a major factor and led to the incorporation of an element on controlling hazards in each OPS unit.

The industry steering committee contained a wide spread of both industry and RTO representation, as well as STA and ITAB representation. It contributed to the design of the reviewed Training Package as well as providing critical feedback on all components.

PMA02 – Version 2

One issue which became clear during the review which lead to PMA02 was that units of competency related to incident preparedness and response were not well handled in the PMA Training Package and that units from the Public Safety Training Package which on the face of it might be appropriate were a very poor fit for this industry and there was a total lack of units in

some areas. This led to MLA mounting the 'Off shore and Major hazard facility Incident Response (OMIR) project, conducted by Training and Assessment Services (TAS) and resulted in the creation of a suite of units (generally including 'OMIR' in the code) which were then incorporated into PMA02. The industry did not seek any specific qualifications relating to these units, preferring to concentrate on the competencies. This project was completed in 2004. Some other consequent changes were made to existing OHS units to ensure they matched the new OMIR units.

Version 3 - Aluminium Smelting

Due to an industry request to modify PMA02 to also cover the technical skills required in aluminium smelting, a small project was funded in late 2005 by Manufacturing Skills Australia (MSA – the Industry Skills Council with coverage of PMA). The development was undertaken by TaPS and the new units of competency completed by mid 2006. Due to some dislocations in the national VET system these units were not endorsed for incorporation into PMA02 until mid 2007.

PMA08 Chemical, Hydrocarbons and Refining Training Package

The scheduled review of PMA02 by MSA commenced early in 2006 with MSA conducting the Phase 1 Review, commencing late 2006. Again TaPS conducted the Phase 2 Review. This part of the review, due to some dislocations in the national VET system, was suspended for a period, finally recommencing in the second half of 2007 with the work being completed towards the end of 2007.

Consultations focussed on specific issues raised both during the Phase 1 Review and other issues identified during the development period. The main vehicle for consultation was specific 'Interest Groups' formed to address these specific issues. Membership of interest groups was predominantly industry personnel who responded to a general email to the MSA database asking for people with interest and expertise in the specific issue. Two special purpose 'interest groups' (one east coast and one west coast) were also held with assistance from State ITABs for RTOs in this sector, primarily to examine packaging rules and other related issues.

These interest groups led to the development of some new units of competency, an attempt to restructure the Certificate IV (ultimately unsuccessful) and a restructuring of the Diploma and the Advanced Diploma.

While these working groups were small and specific, broader general consultation was encouraged both by placing all drafts on the MSA web site and by emails to the general data base advising of progress and the availability of drafts. Drafts were also sent to interested parties directly on request.

This concentration on electronic consultation allowed the broadest participation by industry personnel in an industry where employment is often remote and off shore, and shifts may be 3 weeks on and 3 weeks off. Input was received from people working off shore and even in Papua New Guinea where they are using PMA. The email trail also ensured comments were not lost. This was important due to work being placed on hold in the middle of the project.

The review also occurred during a major rationalisation project being undertaken by MSA. This saw many units of competency which had previously been 'owned' by PMA move into the generic Manufacturing Training Package (MSA07). This has increased the number of imported units of competency as many units which would normally have resided in PMA are now sourced from the general banks in MSA07.

Similarly, MLA and subsequently MSA had been attempting for many years to rationalise the three ‘support qualifications’ in the three process manufacturing Training Packages (PMA, PMB and PMC). The development of MSA07 finally allowed this to occur, resulting in nine very similar qualifications being reduced to three.

At the same time, it was recognised that the ‘technical’ Certificate I in PMA was in reality not a technical qualification and it was agreed it also could be replaced by MSA10207. This has resulted in four essentially duplicated qualifications in PMA02 not being carried forward.

As a result of a specific approach by the surface coatings industry, a Vocational Graduate Certificate has been developed in PMA08. This history of this particular qualification can be traced back 30 years or more. It has always been an industry run qualification, first by OCCA (Oil and Colour Chemists Association) and more recently by SCAA (Surface Coatings Association of Australia – an updated OCCA). While TAFE facilities have been used to deliver the course and qualifications, industry has provided most of the lecturers and also encouraged the students to enrol. With the move to competency based qualifications, it was essential to update the course structure and to develop appropriate units of competency. Industry representatives developed the units of competency (with some guidance and editing by TaPS) and an appropriate qualification structure was created. This has always been a national course and its inclusion in PMA08 will help it maintain and grow its national importance and enrolment. There are already existing industry developed learning resources to support individual learning should participants wish to learn that way.

The project reference group (PRG)

The project was overseen by a group of technical experts (RTOs and industry) who contributed much time and expertise to this project and their contribution is gratefully acknowledged. The PRG members were:

- Don Sanders (Chair, APPEA)
- David Graham (Huntsman)
- Lina.Dickins – Lina was later replaced by Ken Rhodes (Santos)
- Keith.Butler (Gladstone TAFE, representing Peter Cloughton [manager])
- Joe Calabrese (Agility) – Joe later retired and was replaced by Kim Peterson, TAFE NSW
- Gerald Crawford (DEST)
- Derek Cupp (MISAC [SA ITAB])
- Vince Lloyd (Qenos – AWU)
- John Lamont (Nowra Chemicals)
- Celeste Howden (MLA)
- Brenda Micale (DET WA)

Sherelee Rose (DFEEST, SA) also attended one meeting.

The industry participants

Many people made time in their busy schedule to participate in this project. Without their expertise and input, the project would not have been able to achieve its objectives and this is also gratefully acknowledged.

The industry also made available resources for meetings (including catering) and provided examples of their resources to assist in the development of new and revised units of competency.

Their assistance is gratefully acknowledged.

Summary of changes resulting from the review

Environmental changes

The review of PMA02 occurred in an environment of rationalisation and as a step towards laying the foundation for ongoing continuous improvement. There had been some significant changes in the broader Training Package environment since the last review of PMA02, including:

- development and endorsement of MCM04 Competitive Manufacturing
- development and endorsement of MSA07 Manufacturing
- introduction of Vocational Graduate Certificates and Diplomas
- introduction of Skill Sets.

In addition to these changes in the VET scene the industry's use of PMA was increasing and maturing with most of the majors now accepting Certificate II and/or III as a basic qualification for their plant operators/technicians and with a significant body of plant technicians now looking at the Certificate IV and Diploma.

Change of name to 'Chemical, Hydrocarbons and Refining'

To add to the texture of the PMA environment, Australian companies with operations overseas, and individual Australians working overseas are now beginning to seek access to this Australian suite of qualifications.

In addition, industry sectors which had previously been covered by PMA, but which had not actively participated in previous reviews were now also actively involved and these include aluminium smelting and alumina refining and the surface coatings (paint) sectors.

The review also occurred in the midst of a resources led boom. This led to a high state of activity among the industry participants and if anything increased the already high mobility between organisations for hydrocarbon companies.

In keeping with this extension of focus of PMA, and after much deliberation, it was decided that by simply removing 'Oil' from the name resulted in a title that covered the refining of minerals, which is a growing sector for PMA. Industry stakeholders agreed that as the 'oil refining' sector is actually seen as part of 'hydrocarbons', the new name provides a more inclusive title, without loss of the good will and recognition associated with the previous name.

Changes to qualifications in PMA08

PMA02 provided a range of both 'technical' and non-technical or 'support' qualifications. These had an integrated vertical structure, with some facility for moving between technical and support qualifications.

PMA08 only retains the technical qualifications within its structure. The non-technical PMA02 Certificates I, II and III in Process Support have not been carried forward (see below re the rationalised process manufacturing support qualifications available in MSA07).

Certificate I in Process Plant Skills has not been carried forward. In reality, this certificate was not a technical certificate and it is agreed that where there is a workplace need for a Certificate I, the generic MSA10207 Certificate I in Process Manufacturing is an appropriate qualification, with a similar selection of units.

The Certificates II, III and IV remain essentially unchanged, although there are some additional

units.

The Diploma has been restructured to remove the implicit assumption in PMA50102 that the previous Certificates had also been achieved. People with the Certificate IV may achieve some advanced standing depending on the units selected. The structure has been chosen to keep the increment between Certificate IV and Diploma approximately constant.

The Advanced Diploma builds on the Diploma as is currently the case.

Changes to layout of PMA08 qualifications

‘Units are now shown in ‘banks’ in the qualifications framework. This change in format is intended to reduce the confusion which sometimes arose from the PMA02 format. It is also consistent with the format used for other manufacturing Training Packages.

In PMA08, the banks are as follows:

- Group 1 units are the mandatory units (previously called ‘core’ units)
- Group 2 units are the technical units (previously called ‘OPS’ or ‘operations’ units)
- Group 3 units are the support units, and typically will be split into:
 - Group 3A: support units introduced for the qualification and that level
 - Group 3B: support and technical units which may be used for that qualification level but have been available for qualifications at lower levels.

The overall structure and principles of the packaging rules have not changed.

Relocation of support qualifications

Previous reviews of the process manufacturing Training Packages have attempted to rationalise the three support qualifications provided by PMA, PMB and PMC. The creation of MSA07 has allowed this to occur. The three support qualifications (PMA10202, PMA20202 and PMA30202) have not been carried forward into PMA08. These qualifications have been rationalised and moved into MSA07 for use across all of process manufacturing. These qualifications now access a broader range of units, and provide continued access to a similar range of units as in PMA02.

Certificate I

As noted above, PMA10102 Certificate I in Process Plant Skills has also been replaced by MSA10207 in recognition of its role as a non-technical qualification. Appropriate technical units may still be chosen for those wishing to use it as a first step towards PMA20108 Certificate II in Process Plant Operations. While this is not common for the workforces of the major Australian companies, it is still an important route for some to enter formal qualifications.

Addition of a Vocational Graduate Certificate

Advantage has been taken of the new availability of Vocational Graduate Certificates to take an accredited course which has had strong industry support for over 30 years and bring it within the Training Package environment. This has led to PMA70108 Vocational Graduate Certificate in Surface Coating Technology.

Skill Sets

Given the emphasis on safety and incident preparedness/response across the PMA sectors, the industry has supported the inclusion of a range of Skill Sets in PMA08. These have been created

to address specific and ongoing training needs.

Transition arrangements

People with existing qualifications from PMA98 or PMA02 will still have that qualification recognised.

People who have some units of competency recognised (while not having a full qualification) should have the equivalent unit of competency in PMA08 granted and then be assessed for the relevant qualification under PMA08.

People who have enrolled in a course under PMA02 should consult the State Training Authority rules that apply in their State. Typically these will allow a 'phase out' period for the completion of the existing qualification before compulsorily moving them to the PMA08 qualification.

It is not expected that moving to the PMA08 qualification should cause any disadvantage.

Changes to units of competency

New units

There have been some additional units created where the industry had perceived some gaps, or to provide appropriate units for a newly active sector.

Rationalisation

Whereas PMA02 mainly used its own 'native' support units, PMA08 predominantly uses support units drawn from MSA07. This then provides common support units across PMA, PMB and PMC and eventually across a broader range of manufacturing Training Packages. This is expected to facilitate the creation of better resources in somewhat thin markets and to assist RTOs operating across the sectors to have more efficient delivery and assessment tools.

This move is also expected to allow industry a wider choice of units. While the rationalisation process has removed duplicated units, it has also made available more units in total from which to choose.

Prerequisites in PMA08

All prerequisites have been reassessed as part of the review of PMA02. The advice from stakeholders was that with the increase in sectors accessing PMA, unnecessary prerequisites restrict the flexibility of application of a unit of competency.

The prerequisites in PMA08 have been determined on the basis that it is considered essential that the proposed prerequisite unit be gained BEFORE commencing the unit in question. Where this is not necessary, the prerequisite units have been removed.

Competitive Manufacturing

A significant set of units has been imported from the Competitive Manufacturing suite of units recently placed in MSA07v3. This is expected to help industry access units which are better focussed on leading edge manufacturing practice. As a consequence the older Front Line Management units have not been formally imported (although are still available for importation under the importation rules). While industry had used these units, usually in highly contextualised form, the information provided during the review indicated it would be more appropriate to replace them with Competitive Manufacturing units.

Coding issues

The PMA specific technical and support units retain the PMA prefix.

Most support units, and some technical units now come with the MSAPM code indicating they are process manufacturing units drawn from MSA07.

Structure of units

Technical units in PMA02 usually had both an element on hazard control and an element on problem solving. Review of these units showed that this had led to some inadvertent repetition within the units. As working safely and solving problems is an integral part of the job and of competency in any unit, these elements have generally been integrated back into the other elements of the unit.

This is not seen as weakening the emphasis on either of these two aspects, but rather of better placing it in the context of it being part of everything that is done.

TAA units

As the BSZ training and assessment units have been withdrawn and are no longer available for importation to a Training Package, they have been replaced with the TAA units required to become a workplace assessor. Only those units required to be a qualified workplace assessor have been included. The other units leading to the Certificate IV have not been included.

Note people with the existing BSZ units are not required to retrain to the TAA units to continue assessing (unless they are assessing the TAA units). Please consult the ATQF2007 for details.

Two Certificate III units have also been imported, on industry advice, for those not requiring the full assessor qualification of three TAA units.

Assessment Guidelines

The Assessment Guidelines are the current version provided by DEST. The industry specific section provides similar information to that provided in PMA02.

History

PMA08v3 New units of competency

Code	Title
PMASUP244A	Prepare and isolate plant
PMASUP444A	Plan plant preparation and isolation
New imported unit	
NWP357B	Monitor, operate and control reverse osmosis and nano-filtration processes

PMA08 Version 2

New PMA units of competency

PMAOPS233A	Monitor wells and gathering systems	New to PMA08v2
PMAOPS234A	Monitor and operate low pressure compressors	New to PMA08v2
PMAOPS241A	Operate Joule-Thomson effect device	New to PMA08v2
PMAOPS280B	Interpret process plant schematics	Equivalent outcome. Clarified wording
PMAOPS333A	Operate wells and gathering systems	New to PMA08v2
PMAOPS433A	Manage wells and gathering systems	New to PMA08v2
PMAOPS434A	Commission wells and gathering systems	New to PMA08v2

PMA08v3 New units of competency

Code	Title
PMASUP244A	Prepare and isolate plant
PMASUP444A	Plan plant preparation and isolation
New imported unit	
NWP357B	Monitor, operate and control reverse osmosis and nano-filtration processes

Revised imported units for confined space entry

MSAPMPER200C	Work in accordance with an issued permit	Equivalent outcome. Updated to reflect changes in MSAPER205C
MSAPMPER205C	Enter confined space	Equivalent outcome. Updated to reflect changes to Australian Standard
MSAPMPER300C	Issue work permits	Equivalent outcome. Updated to reflect changes in MSAPER205C

PMA08 Version 1 – primary release

Qualifications Framework

The Australian Qualifications Framework

What is the Australian Qualifications Framework?

A brief overview of the Australian Qualifications Framework (AQF) follows. For a full explanation of the AQF, see the *AQF Implementation Handbook*. The 2007 version of the *AQF Implementation Handbook* is expected to be available on the Australian Qualifications

Framework Advisory Board (AQFAB) website www.aqf.edu.au during September 2007, and in print in October 2007 (obtain the hard copy by contacting AQFAB on phone 03 9639 1606 or email at aqfab@curriculum.edu.au).

The AQF provides a comprehensive, nationally consistent framework for all qualifications in post-compulsory education and training in Australia. In the vocational education and training (VET) sector it assists national consistency for all trainees, learners, employers and providers by enabling national recognition of qualifications and Statements of Attainment.

Training Package qualifications in the VET sector must comply with the titles and guidelines of the AQF. Endorsed Training Packages provide a unique title for each AQF qualification which must always be reproduced accurately.

Qualifications

Training Packages can incorporate the following eight AQF qualifications.

- Certificate I in ...
- Certificate II in ...
- Certificate III in ...
- Certificate IV in ...
- Diploma of ...
- Advanced Diploma of ...
- Vocational Graduate Certificate of ...
- Vocational Graduate Diploma of ...

On completion of the requirements defined in the Training Package, a Registered Training Organisation (RTO) may issue a nationally recognised AQF qualification. Issuance of AQF qualifications must comply with the advice provided in the *AQF Implementation Handbook* and the *AQTF 2007 Essential Standards for Registration*.

Statement of Attainment

A Statement of Attainment is issued by a Registered Training Organisation when an individual has completed one or more units of competency from nationally recognised qualification(s)/courses(s). Issuance of Statements of Attainment must comply with the advice provided in the current *AQF Implementation Handbook* and the *AQTF 2007 Essential Standards for Registration*.

Under the AQTF 2007, RTOs must recognise the achievement of competencies as recorded on a qualification or Statement of Attainment issued by other RTOs. Given this, recognised competencies can progressively build towards a full AQF qualification.

AQF Guidelines and Learning Outcomes

The *AQF Implementation Handbook* provides a comprehensive guideline for each AQF qualification. A summary of the learning outcome characteristics and their distinguishing features for each VET related AQF qualification is provided below.

Certificate I

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and skills would prepare a person to perform a defined range of activities most of which may be routine and predictable.

Applications may include a variety of employment related skills including preparatory access and participation skills, broad-based induction skills and/or specific workplace skills. They may also include participation in a team or work group.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate knowledge by recall in a narrow range of areas;
- demonstrate basic practical skills, such as the use of relevant tools;
- perform a sequence of routine tasks given clear direction
- receive and pass on messages/information.

Certificate II

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and skills would prepare a person to perform in a range of varied activities or knowledge application where there is a clearly defined range of contexts in which the choice of actions required is usually clear and there is limited complexity in the range of operations to be applied.

Performance of a prescribed range of functions involving known routines and procedures and some accountability for the quality of outcomes.

Applications may include some complex or non-routine activities involving individual responsibility or autonomy and/or collaboration with others as part of a group or team.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate basic operational knowledge in a moderate range of areas;
- apply a defined range of skills;
- apply known solutions to a limited range of predictable problems;
- perform a range of tasks where choice between a limited range of options is required;
- assess and record information from varied sources;
- take limited responsibility for own outputs in work and learning.

Certificate III

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and competencies would cover selecting, adapting and transferring skills and knowledge to new environments and providing technical advice and some leadership in resolution of specified problems. This would be applied across a range of roles in a variety of contexts with some complexity in the extent and choice of options available.

Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgement is required in the selection of equipment, services or contingency measures and within known time constraints.

Applications may involve some responsibility for others. Participation in teams including group or team co-ordination may be involved.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate some relevant theoretical knowledge
- apply a range of well-developed skills
- apply known solutions to a variety of predictable problems
- perform processes that require a range of well-developed skills where some discretion and judgement is required
- interpret available information, using discretion and judgement
- take responsibility for own outputs in work and learning
- take limited responsibility for the output of others.

Certificate IV

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and competencies would cover a broad range of varied activities or application in a wider variety of contexts most of which are complex and non-routine. Leadership and guidance are involved when organising activities of self and others as well as contributing to technical solutions of a non-routine or contingency nature.

Performance of a broad range of skilled applications including the requirement to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organisation of, others.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts
- apply solutions to a defined range of unpredictable problems
- identify and apply skill and knowledge areas to a wide variety of contexts, with depth in some areas
- identify, analyse and evaluate information from a variety of sources
- take responsibility for own outputs in relation to specified quality standards
- take limited responsibility for the quantity and quality of the output of others.

Diploma

Characteristics of Learning Outcomes

Breadth, depth and complexity covering planning and initiation of alternative approaches to skills or knowledge applications across a broad range of technical and/or management requirements, evaluation and co-ordination.

The self directed application of knowledge and skills, with substantial depth in some areas where judgment is required in planning and selecting appropriate equipment, services and techniques for self and others.

Applications involve participation in development of strategic initiatives as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team co-ordination may be involved.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

Distinguishing Features of Learning Outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas
- analyse and plan approaches to technical problems or management requirements
- transfer and apply theoretical concepts and/or technical or creative skills to a range of situations
- evaluate information, using it to forecast for planning or research purposes
- take responsibility for own outputs in relation to broad quantity and quality parameters
- take some responsibility for the achievement of group outcomes.

Advanced Diploma

Characteristics of Learning Outcomes

Breadth, depth and complexity involving analysis, design, planning, execution and evaluation across a range of technical and/or management functions including development of new criteria or applications or knowledge or procedures.

The application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts in relation to either varied or highly specific functions. Contribution to the development of a broad plan, budget or strategy is involved and accountability and responsibility for self and others in achieving the outcomes is involved.

Applications involve significant judgement in planning, design, technical or leadership/guidance functions related to products, services, operations or procedures.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

Distinguishing Features of Learning Outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of specialised knowledge with depth in some areas

- analyse, diagnose, design and execute judgements across a broad range of technical or management functions
- generate ideas through the analysis of information and concepts at an abstract level
- demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills
- demonstrate accountability for personal outputs within broad parameters
- demonstrate accountability for personal and group outcomes within broad parameters.

Vocational Graduate Certificate

Characteristics of competencies or learning outcomes

- The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Substantial breadth and complexity involving the initiation, analysis, design, planning, execution and evaluation of technical and management functions in highly varied and highly specialised contexts.
- Applications involve making significant, high-level, independent judgements in major broad or planning, design, operational, technical and management functions in highly varied and specialised contexts. They may include responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.
- The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

- Demonstrate the self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Initiate, analyse, design, plan, execute and evaluate major broad or technical and management functions in highly varied and highly specialised contexts.
- Generate and evaluate ideas through the analysis of information and concepts at an abstract level.
- Demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills in complex contexts.
- Demonstrate responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.

Vocational Graduate Diploma

Characteristics of competencies or learning outcomes

- The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Substantial breadth, depth and complexity involving the initiation, analysis, design, planning, execution and evaluation of major functions, both broad and highly specialised, in highly varied and highly specialised contexts.
- Further specialisation within a systematic and coherent body of knowledge.

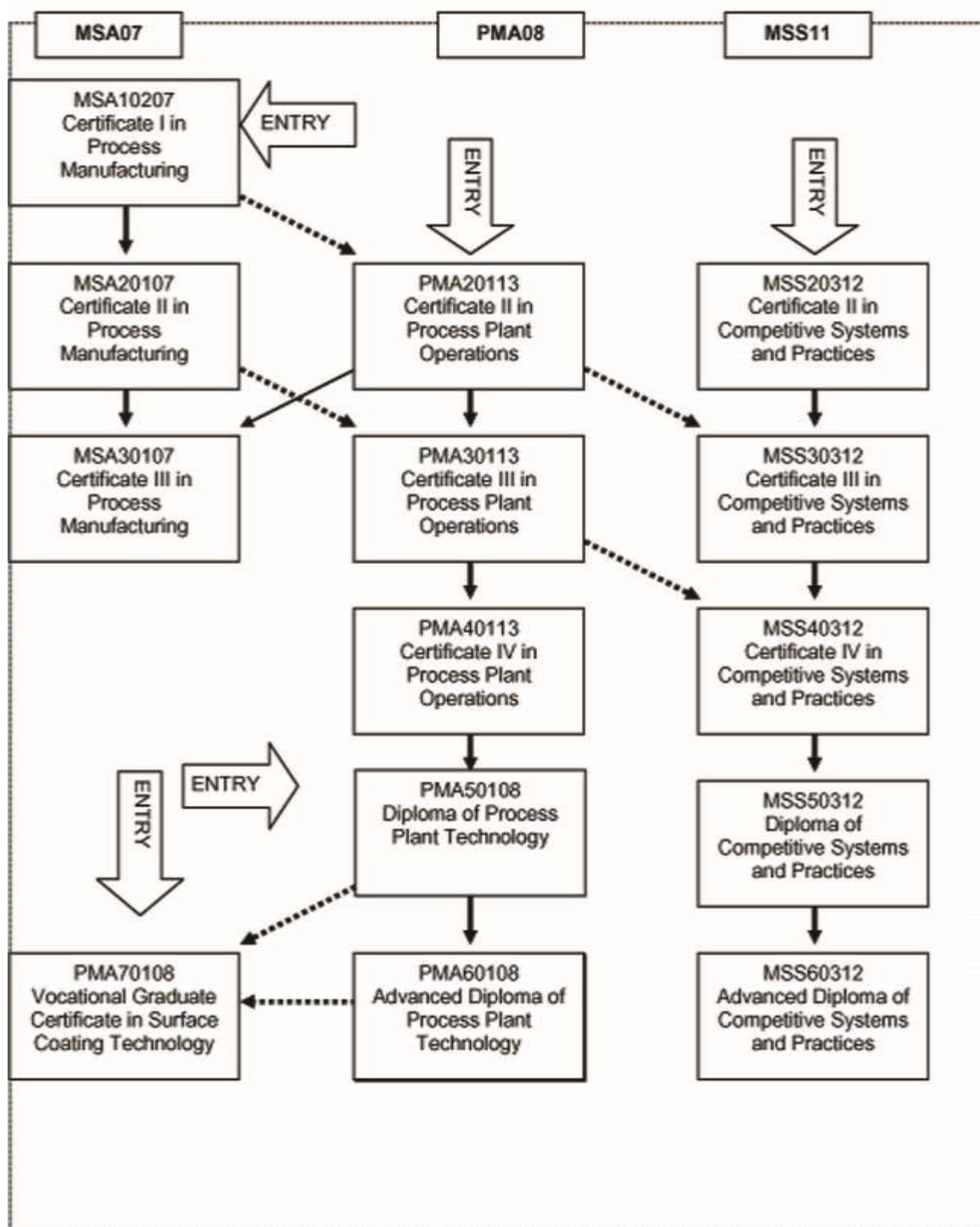
- Applications involve making high-level, fully independent, complex judgements in broad planning, design, operational, technical and management functions in highly varied and highly specialised contexts. They may include full responsibility and accountability for all aspects of work and functions of others, including planning, budgeting and strategy development.
- The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

- Demonstrate the self-directed development and achievement of broad and highly specialised areas of knowledge and skills, building on prior knowledge and skills.
- Initiate, analyse, design, plan, execute and evaluate major functions, both broad and within highly varied and highly specialised contexts.
- Generate and evaluate complex ideas through the analysis of information and concepts at an abstract level.
- Demonstrate an expert command of wide-ranging, highly specialised, technical, creative or conceptual skills in complex and highly specialised or varied contexts.
- Demonstrate full responsibility and accountability for personal outputs.
- Demonstrate full responsibility and accountability for all aspects of the work or functions of others, including planning, budgeting and strategy.
-

Qualification Pathways

This Training Package (PMA08) contains the technical qualifications for this industry. Additional relevant qualifications are contained within MSA07. With appropriate choice of units within a qualification from MSA07 and MSS11 there may be articulation with PMA08 qualifications.



Employability Skills

Employability Skills replacing Key Competency information from 2006

In May 2005, the approach to incorporate Employability Skills within Training Package qualifications and units of competency was endorsed. As a result, from 2006 Employability Skills will progressively replace Key Competency information in Training Packages.

Background to Employability Skills

Employability Skills are also sometimes referred to as generic skills, capabilities or Key Competencies. The Employability Skills discussed here build on the Mayer Committee's Key Competencies, which were developed in 1992 and attempted to describe generic competencies for effective participation in work.

The Business Council of Australia (BCA) and the Australian Chamber of Commerce and Industry (ACCI), produced the Employability Skills for the Future report in 2002 in consultation with other peak employer bodies and with funding provided by the Department of Education, Science and Training (DEST) and the Australian National Training Authority (ANTA). Officially released by Dr Nelson (Minister for Education, Science and Training) on 23 May 2002, copies of the report are available from the DEST website at: http://www.dest.gov.au/archive/ty/publications/employability_skills/index.htm.

The report indicated that business and industry now require a broader range of skills than the Mayer Key Competencies Framework and featured an Employability Skills Framework identifying eight Employability Skills*:

- communication
- teamwork
- problem solving
- initiative and enterprise
- planning and organising
- self-management
- learning
- technology.

The report demonstrated how Employability Skills can be further described for particular occupational and industry contexts by sets of facets. The facets listed in the report are the aspects of the Employability Skills that the sample of employers surveyed identified as being important work skills. These facets were seen by employers as being dependent both in their nature and priority on an enterprise's business activity.

* Personal attributes that contribute to employability were also identified in the report but are not part of the Employability Skills Framework.

Employability Skills Framework

The following table contains the Employability Skills facets identified in the report Employability Skills for the Future.

	Employability Skills replacing Key Competency

	information from 2006
	In May 2005, the approach to incorporate Employability Skills within Training Package qualifications and units of competency was endorsed. As a result, from 2006 Employability Skills will progressively replace Key Competency information in Training Packages.
Communication that contributes to productive and harmonious relations across employees and customers	• writing to the needs of the audience • negotiating responsively • reading independently • empathising • using numeracy effectively • understanding the needs of internal and external customers • persuading effectively • establishing and using networks • being assertive • sharing information • speaking and writing in languages other than English
Teamwork that contributes to productive working relationships and outcomes	• working across different ages irrespective of gender, race, religion or political persuasion • working as an individual and as a member of a team • knowing how to define a role as part of the team • applying teamwork to a range of situations e.g. futures planning and crisis problem solving • identifying the strengths of team members • coaching and mentoring skills, including giving feedback
Problem solving that contributes to productive outcomes	• developing creative, innovative and practical solutions • showing independence and initiative in identifying and solving problems • solving problems in teams • applying a range of strategies to problem solving • using mathematics, including budgeting and financial management to solve problems • applying problem-solving strategies across a range of areas • testing assumptions, taking into account the context of data and circumstances • resolving customer concerns in relation to complex project issues
Initiative and enterprise that contribute to innovative outcomes	• adapting to new situations • developing a strategic, creative and long-term vision

	• being creative • identifying opportunities not obvious to others • translating ideas into action • generating a range of options • initiating innovative solutions
Planning and organising that contribute to long and short-term strategic planning	• managing time and priorities - setting time lines, coordinating tasks for self and with others • being resourceful • taking initiative and making decisions • adapting resource allocations to cope with contingencies • establishing clear project goals and deliverables • allocating people and other resources to tasks • planning the use of resources, including time management • participating in continuous improvement and planning processes • developing a vision and a proactive plan to accompany it
	• predicting - weighing up risk, evaluating alternatives and applying evaluation criteria • collecting, analysing and organising information • understanding basic business systems and their relationships
Self-management that contributes to employee satisfaction and growth	• having a personal vision and goals • evaluating and monitoring own performance • having knowledge and confidence in own ideas and visions • articulating own ideas and visions • taking responsibility
Learning that contributes to ongoing improvement and expansion in employee and company operations and outcomes	• managing own learning • contributing to the learning community at the workplace • using a range of mediums to learn - mentoring, peer support and networking, IT and courses • applying learning to technical issues (e.g. learning about products) and people issues (e.g. interpersonal and cultural aspects of work) • having enthusiasm for ongoing learning • being willing to learn in any setting - on and off the job • being open to new ideas and techniques • being prepared to invest time and effort in learning

	new skills acknowledging the need to learn in order to accommodate change
Technology that contributes to the effective carrying out of tasks	- having a range of basic IT skills - applying IT as a management tool - using IT to organise data - being willing to learn new IT skills - having the OHS knowledge to apply technology - having the appropriate physical capacity

Employability Skills Summary

An Employability Skills Summary exists for each qualification. Summaries provide a lens through which to view Employability Skills at the qualification level and capture the key aspects or facets of the Employability Skills that are important to the job roles covered by the qualification. Summaries are designed to assist trainers and assessors to identify and include important industry application of Employability Skills in learning and assessment strategies.

The following is important information for trainers and assessors about Employability Skills Summaries.

- Employability Skills Summaries provide examples of how each skill is applicable to the job roles covered by the qualification.
- Employability Skills Summaries contain general information about industry context which is further explained as measurable outcomes of performance in the units of competency in each qualification.
- The detail in each Employability Skills Summary will vary depending on the range of job roles covered by the qualification in question.
- Employability Skills Summaries are not exhaustive lists of qualification requirements or checklists of performance (which are separate assessment tools that should be designed by trainers and assessors after analysis at the unit level).
- Employability Skills Summaries contain information that may also assist in building learners' understanding of industry and workplace expectations.
-

Industry Requirements for Employability Skills

This is a technology based industry and a key role of operations personnel is the solving of problems. They are largely self managed and are expected to operate in both permanent and *ad hoc* teams as required. The communication of key safety, health, environmental and operational information to other personnel on site is a vital requirement.

Examples from this Training Package of Employability Skills embedded within unit components

Unit component	Example of embedded Employability Skill

Unit component	Example of embedded Employability Skill
Unit Title	Operate fluid flow equipment (organising, problem solving, technology)
Unit Descriptor	This competency covers the operation of the range of pumps and valves typically encountered in the fluid flow system of a processing plant. It includes identifying, operating, monitoring and troubleshooting these items. (planning, organising, problem solving, technology)
Element	Prepare for work (planning and organising) Respond to fluid system problems (technology, problem solving)
Performance Criteria	Coordinate with appropriate personnel (communication, teamwork) Take appropriate action (initiative and enterprise, technology, communication)
Range Statement	Following through items initiated (learning, communication, initiative and enterprise)
Required Skills and Knowledge	Recognise and resolve operational problems (technology, problem solving, learning) Take corrective action appropriate to the problem cause (initiative and enterprise, planning and organising, communication, technology, problem solving, team work)
Evidence Guide	Assessment of this unit should demonstrate competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical (Initiative and enterprise, Learning, Planning and organising, Communication, Problem solving, Technology, Self management, Teamwork)

Skill Sets

Definition

Skill sets are defined as single units of competency, or combinations of units of competency from an endorsed Training Package, which link to a licence or regulatory requirement, or defined industry need.

Wording on Statements of Attainment

Skill sets are a way of publicly identifying logical groupings of units of competency which meet an identified need or industry outcome. Skill sets are not qualifications.

Where skill sets are identified in a Training Package, the Statement of Attainment can set out the competencies a person has achieved in a way that is consistent and clear for employers and others. This is done by including the wording "these competencies meet [insert skill set title or identified industry area] need" on the Statement of Attainment. This wording applies only to skill sets that are formally identified as such in the endorsed Training Package. See the 2007 edition of the AQF Implementation Handbook for advice on wording on Statements of Attainment the updated version is expected to be available on the AQFAB website www.aqf.edu.au during September 2007 and in print in October 2007.

Skill Sets in this Training Package

Industry has supported the creation of a range of Skill Sets, mainly in safety and incident preparedness/response areas.

Some job roles in some sectors of the industry do require a licence, however, there is no overall industry requirement for this and so no Skill Sets associated with licensing have been proposed.

The industry manages the competency requirements of its workforce to ensure compliance with a vast web of regulatory requirements. The Skill Sets below have been developed in consultation with the industry and are based on logical clusters of units which meet critical industry needs, particularly in the area of safety and incident preparedness and response.

These Skill Sets consist of clusters of competencies which are commonly practiced (and possibly trained) together. They reflect an industry-wide need to be able to recognise that a person can undertake these defined roles.

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PMASS00001 Confined space work team

PMASS00002 Contractor induction

PMASS00003	Emergency centre team
PMASS00004	Hot work observer
PMASS00005	Incident response commander
PMASS00006	Incident response team leader
PMASS00007	Incident response team member
PMASS00008	Offshore crane driver
PMASS00009	Offshore incident response team member
PMASS00010	Offshore operator safety induction
PMASS00011	Pipeline transmission
PMASS00012	Workplace assessor

Assessment Guidelines

Introduction

These Assessment Guidelines provide the endorsed framework for assessment of units of competency in this Training Package. They are designed to ensure that assessment is consistent with the AQTF 2007. Assessments against the units of competency in this Training Package must be carried out in accordance with these Assessment Guidelines.

Assessment System Overview

This section provides an overview of the requirements for assessment when using this Training Package, including a summary of the AQTF requirements; licensing/registration requirements; and assessment pathways.

Quality assessment underpins the credibility of the vocational education and training sector. The Assessment Guidelines of a Training Package are an important tool in supporting quality assessment.

Assessment within the National Skills Framework is the process of collecting evidence and making judgements about whether competency has been achieved to confirm whether an individual can perform to the standards expected in the workplace, as expressed in the relevant endorsed unit of competency.

Assessment must be carried out in accordance with the:

- benchmarks for assessment
- specific industry requirements
- principles of assessment

- rules of evidence
- assessment requirements set out in the AQTF

Benchmarks for Assessment

The endorsed units of competency in this Training Package are the benchmarks for assessment. As such, they provide the basis for nationally recognised Australian Qualifications Framework (AQF) qualifications and Statements of Attainment issued by Registered Training Organisations (RTOs).

Australian Quality Training Framework Assessment Requirements

Assessment leading to nationally recognised AQF qualifications and Statements of Attainment in the vocational education and training sector must meet the requirements of the AQTF as expressed in the AQTF 2007 *Essential Standards for Registration*.

The AQTF 2007 *Essential Standards for Registration* can be downloaded from www.training.com.au/aqtf2007>. The following points summarise assessment requirements.

Registration of Training Organisations

Assessment must be conducted by, or on behalf of, an RTO formally registered by a State or Territory Registering/Course Accrediting Body in accordance with the AQTF 2007 *Essential Standards for Registration*. The RTO must have the specific units of competency and/or AQF qualifications on its scope of registration.

Quality Training and Assessment

Each RTO must provide quality training and assessment across all its operations. See the AQTF 2007 *Essential Standards for Registration*, Standard 1.

Assessor Competency Requirements

Each person involved in training, assessment or client service must be competent for the functions they perform. See the AQTF 2007 *Essential Standards for Registration*, Standard 1, for assessor (and trainer) competency requirements.

Assessment Requirements

The RTOs assessments, including RPL, must meet the requirements of the relevant endorsed Training Package. See the AQTF 2007 *Essential Standards for Registration*, Standard 1.

Assessment Strategies

Each RTO must have strategies for training and assessment that meet the requirements of the relevant Training Package or accredited course and are developed in consultation with industry stakeholders. See the AQTF 2007 *Essential Standards for Registration*, Standard 1.

National Recognition

Each RTO must recognise the AQF qualifications and Statements of Attainment issued by any other RTO. See the AQTF 2007 *Essential Standards for Registration*, Condition of Registration 7: Recognition of qualifications issued by other RTOs.

Access and Equity and Client Outcomes

Each RTO must adhere to the principles of access and equity and maximise outcomes for its clients. See the AQTF 2007 *Essential Standards for Registration*, Standard 2.

Monitoring Assessments

Training and/or assessment provided on behalf of the RTO must be monitored to ensure that it is in accordance with all aspects of the Essential Standards for Registration. See the AQTF 2007 *Essential Standards for Registration*, Standard 3.

Recording Assessment Outcomes

Each RTO must manage records to ensure their accuracy and integrity. See the AQTF 2007 *Essential Standards for Registration*, Standard 3.

Issuing AQF Qualifications and Statements of Attainment

Each RTO must issue AQF qualifications and Statements of Attainment that meet the requirements of the current AQF Implementation Handbook and the endorsed Training Packages within the scope of its registration. An AQF qualification is issued once the full requirements for a qualification, as specified in the nationally endorsed Training Package are met. A Statement of Attainment is issued when an individual has completed one or more units of competency from nationally recognised qualification(s)/courses(s). See the AQTF 2007 and the 2007 edition of the AQF Implementation Handbook-available on the AQFAB website < www.aqf.edu.au >.

Licensing is not generally required in this industry. Licenses may be required in some States for some units of competency. Check local regulations for details.

Requirements for Assessors

Assessors will be required to meet the AQTF requirements. This includes demonstrated technical competency for the PMA units assessed.

Where assessment relates to a unit which may have a licensing requirements the assessor may also need to be licensed.

Requirements for RTOs

RTOs will need to be able to gather evidence from the workplace for determining competency in technical units at Certificate II, III and IV.

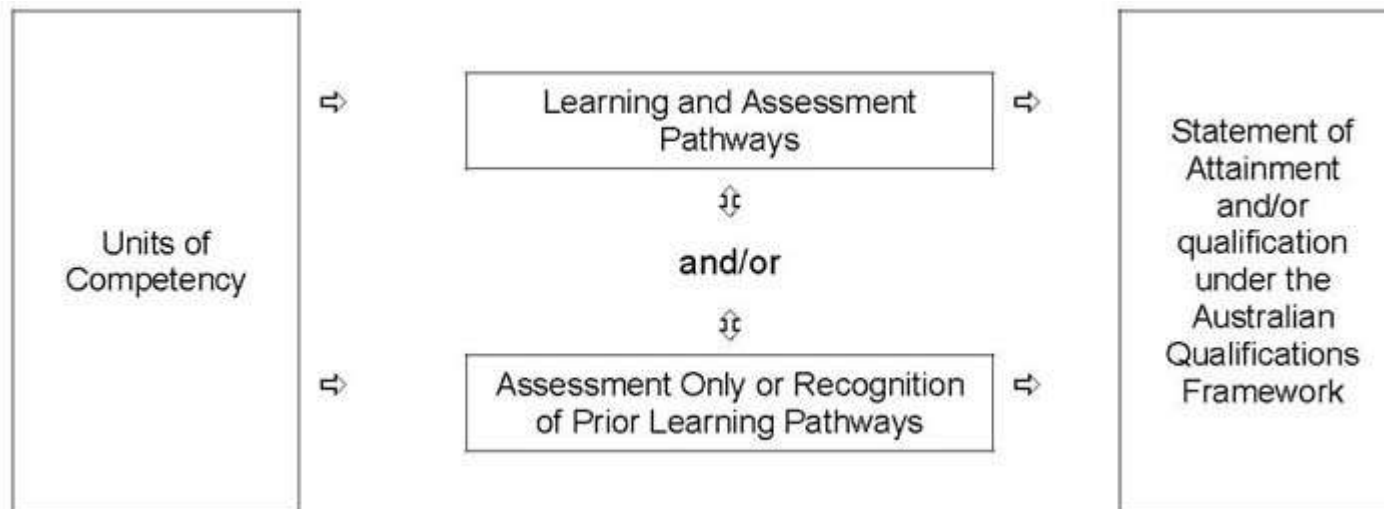
Where delivery and assessment relates to units which may have a licensing requirement the RTO may also need to satisfy the requirements of the local licensing authority.

Pathways

The competencies in this Training Package may be attained in a number of ways including through:

- formal or informal education and training
- experiences in the workplace
- general life experience, and/or
- any combination of the above.

Assessment under this Training Package leading to an AQF qualification or Statement of Attainment may follow a learning and assessment pathway, an assessment-only or recognition pathway, or a combination of the two as illustrated in the following diagram.



Each of these assessment pathways leads to full recognition of competencies held - the critical issue is that the candidate is competent, not how the competency was acquired.

Assessment, by any pathway, must comply with the assessment requirements set out in the Assessment Guidelines of the Training Package and the AQTF 2007.

Learning and Assessment Pathways

Usually, learning and assessment are integrated, with assessment evidence being collected and feedback provided to the candidate at anytime throughout the learning and assessment process.

Learning and assessment pathways may include structured programs in a variety of contexts using a range of strategies to meet different learner needs. Structured learning and assessment programs could be: group-based, work-based, project-based, self-paced, action learning-based; conducted by distance or e-learning; and/or involve practice and experience in the workplace.

Learning and assessment pathways to suit Australian Apprenticeships have a mix of formal structured training and structured workplace experience with formative assessment activities through which candidates can acquire and demonstrate skills and knowledge from the relevant units of competency.

Assessment-Only or Recognition of Prior Learning Pathway

Competencies already held by individuals can be formally assessed against the units of competency in this Training Package, and should be recognised regardless of how, when or where they were achieved.

In an assessment-only or Recognition of Prior Learning (RPL) pathway, the candidate provides current, quality evidence of their competency against the relevant unit of competency. This process may be directed by the candidate and verified by the assessor, such as in the compilation of portfolios; or directed by the assessor, such as through observation of workplace performance and skills application, and oral and/or written assessment. Where the outcomes of this process indicate that the candidate is competent, structured training is not required. The RPL requirements of the AQTF 2007 must be met (Standard 1).

As with all assessment, the assessor must be confident that the evidence indicates that the candidate is currently competent against the endorsed unit of competency. This evidence may take a variety of forms and might include certification, references from past employers, testimonials from clients, and work samples. The onus is on candidates to provide sufficient evidence to satisfy assessors that they currently hold the relevant competencies. In judging evidence, the assessor must ensure that the evidence of prior learning is:

- authentic (the candidate's own work)
- valid (directly related to the current version of the relevant endorsed unit of competency)
- reliable (shows that the candidate consistently meets the endorsed unit of competency)
- current (reflects the candidate's current capacity to perform the aspect of the work covered by the endorsed unit of competency), and
- sufficient (covers the full range of elements in the relevant unit of competency and addresses the four dimensions of competency, namely task skills, task management skills, contingency management skills, and job/role environment skills).

The assessment only or recognition of prior learning pathway is likely to be most appropriate in the following scenarios:

- candidates enrolling in qualifications who want recognition for prior learning or current competencies
- existing workers
- individuals with overseas qualifications
- recent migrants with established work histories
- people returning to the workplace, and
- people with disabilities or injuries requiring a change in career.

Combination of Pathways

Where candidates for assessment have gained competencies through work and life experience and gaps in their competence are identified, or where they require training in new areas, a combination of pathways may be appropriate.

In such situations, the candidate may undertake an initial assessment to determine their current competency. Once current competency is identified, a structured learning and assessment program ensures that the candidate acquires the required additional competencies identified as gaps.

Assessor Requirements

This section identifies the mandatory competencies for assessors, and clarifies how others may contribute to the assessment process where one person alone does not hold all the required competencies.

Assessor Competencies

The AQTF 2007 specifies mandatory competency requirements for assessors. For information, Standard 1, Element 1.4 from the AQTF 2007 Essential Standards for Registration follows:

1.4 Training and assessment is delivered by trainers and assessors who:

- a) have the necessary training and assessment competencies as determined by the National Quality Council or its successors*
- b) have the relevant vocational competencies at least to the level being delivered or assessed*
- c) continue developing their vocational and training and assessment competencies to support continuous improvements in the delivery of the RTO's services.*

Designing Assessment Tools

This section provides an overview on the use and development of assessment tools.

Use of Assessment Tools

Assessment tools provide a means of collecting the evidence that assessors use in making judgments about whether candidates have achieved competency.

There is no set format or process for the design, production or development of assessment tools. Assessors may use prepared assessment tools, such as those specifically developed to support this Training Package, or they may develop their own.

Using Prepared Assessment Tools

If using prepared assessment tools, assessors should ensure these are benchmarked, or mapped, against the current version of the relevant unit of competency. This can be done by checking that the materials are listed on the National Training Information Service < www.ntis.gov.au >. Materials on the list have been noted by the National Quality Council as meeting their quality criteria for Training Package support materials.

Developing Assessment Tools

When developing assessment tools, assessors must ensure that they:

- are benchmarked against the relevant unit or units of competency
- are reviewed as part of the continuous improvement of assessment strategies as required under Standard 1 of the AQTF 2007
- meet the assessment requirements expressed in Standard 1 of the AQTF 2007.

A key reference for assessors developing assessment tools is TAE10 Training and Assessment Training Package and the unit of competency TAE502B Design and develop assessment tools. There is no set format or process for the design, production or development of assessment materials.

Conducting Assessment

This section details the mandatory assessment requirements and provides information on equity in assessment including reasonable adjustment.

Assessment Requirements

Assessments must meet the criteria set out in the AQTF 2007 Essential Standards for Registration.

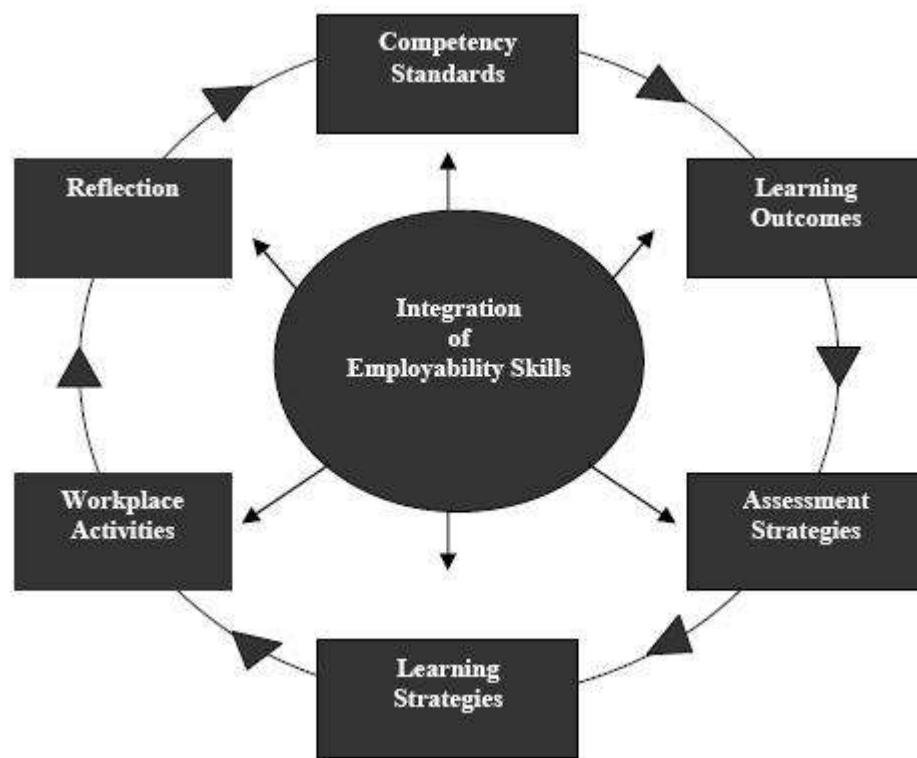
For information, the mandatory assessment requirements from Standard 1 from the AQTF 2007 Essential Standards for Registration are as follows:

1.5 Assessment, including Recognition of Prior Learning:

- a) meets the requirements of the relevant Training Package or accredited course,*
- b) is conducted in accordance with the principles of assessment and the rules of evidence, and*
- c) meets workplace and, where relevant, regulatory requirements.*

Assessment of Employability Skills

Employability Skills are integral to workplace competency. As such they must be considered in the design, customisation, delivery and assessment of vocational education and training programs in an integrated and holistic way, as represented diagrammatically below.



Employability Skills are embedded and explicit within each unit of competency. Training providers must use Employability Skills information in order to design valid and reliable training and assessment strategies. This analysis could include:

- reviewing units of competency to locate relevant Employability Skills and determine how they are applied within the unit
- analysing the Employability Skills Summary for the qualification in which the unit or units are packaged to help clarify relevant industry and workplace contexts and the application of Employability Skills at that qualification outcome
- designing training and assessment to address Employability Skills requirements.

Employability Skills in the Chemical, Hydrocarbons and Refining context

Employability skills are embedded in the units of this Training Package. In particular the use of technology and the solving of problems in a safe and healthy environment are the key focus of the technical units.

For more information on Employability Skills in Manufacturing Industry Skills Council Training

Packages go to the Manufacturing Industry Skills Council website at <http://www.mskills.com.au>.

Access and Equity

An individual's access to the assessment process should not be adversely affected by restrictions placed on the location or context of assessment beyond the requirements specified in this Training Package: training and assessment must be bias-free.

Under the rules for their development, Training Packages must reflect and cater for the increasing diversity of Australia's VET clients and Australia's current and future workforce. The flexibilities offered by Training Packages should enhance opportunities and potential outcomes for all people so that we can all benefit from a wider national skills base and a shared contribution to Australia's economic development and social and cultural life.

Reasonable adjustments

It is important that education providers take meaningful, transparent and reasonable steps to consult, consider and implement reasonable adjustments for students with disability.

Under the Disability Standards for Education 2005, education providers must make reasonable adjustments for people with disability to the maximum extent that those adjustments do not cause that provider unjustifiable hardship. While "reasonable adjustment" and "unjustifiable hardship" are different concepts and involve different considerations, they both seek to strike a balance between the interests of education providers and the interests of students with and without disability.

An adjustment is any measure or action that a student requires because of their disability, and which has the effect of assisting the student to access and participate in education and

training on the same basis as students without a disability. An adjustment is reasonable if it achieves this purpose while taking into account factors such as the nature of the student's disability, the views of the student, the potential effect of the adjustment on the student and others who might be affected, and the costs and benefits of making the adjustment.

An education provider is also entitled to maintain the academic integrity of a course or program and to consider the requirements or components that are inherent or essential to its nature when assessing whether an adjustment is reasonable. There may be more than one adjustment that is reasonable in a given set of circumstances; education providers are required to make adjustments that are reasonable and that do not cause them unjustifiable hardship.

See Part 4, Chapter 2 of the Training Package Development Handbook (DEST, September 2007) for more information on reasonable adjustment, including examples of adjustments.

Further Sources of Information

The section provides a listing of useful contacts and resources to assist assessors in planning, designing, conducting and reviewing of assessments against this Training Package.

Contacts

Manufacturing Skills Australia

Level 7, 80 Arthur Street

North Sydney

PO Box 289

North Sydney 2059

P 02 9955 5500

F 02 9955 8044

E info@mskills.com.au

W <http://www.mskills.com.au/>

Technical and Vocational Education and Training (TVET) Australia Limited
Level 21, 390 St Kilda Road, Melbourne VIC 3150
PO Box 12211, A"Beckett Street Post Office
MELBOURNE VICTORIA 8006
Ph: +61 3 9832 8100
Fax: +61 3 9832 8198
Email: sales@tvetaustralia.com.au
Web: www.tvetaustralia.com.au

For information on the TAA04 Training and Assessment Training Package contact:
Innovation & Business Skills Australia Level 2, Building B, 192 Burwood Road
HAWTHORN VIC 3122
Telephone: (03) 9815 7000
Facsimile: (03) 9815 7001
Web: www.ibsa.org.au
Email: virtual@ibsa.org.au

General Resources

Refer to <http://antapubs.dest.gov.au/publications/search.asp> to locate the following ANTA publications.

AQF Implementation Handbook, third Edition. Australian Qualifications Framework Advisory Board, 2002, aqf.edu.au

Australian Quality Training Framework 2007 (AQTF 2007) - for information and resources go to < www.training.com.au/aqtf2007 >

AQTF 2007 Essential Standards for Registration. Training organisations must meet these standards in order to deliver and assess nationally recognised training and issue nationally recognised qualifications. They include three standards, a requirement for registered training organisations to gather information on their performance against three quality indicators, and nine conditions of registration

AQTF 2007 User's Guide to the Essential Standards for Registration. A Users' Guide for training organisations who must meet these standards in order to deliver and assess nationally recognised training and issue nationally recognised qualifications.

AQTF 2007 Standards for Accredited Courses. State and Territory accrediting bodies are responsible for accrediting courses. This standard provides a national operating framework and template for the accreditation of courses.

TAA04 Training and Assessment Training Package. This is available from the Innovation and Innovation & Business Skills Australia (IBSA) Industry Skills Council and can be viewed, and components downloaded, from the National Training Information Service (NTIS).

National Training Information Service, an electronic database providing comprehensive information about RTOs, Training Packages and accredited courses - www.ntis.gov.au

Training Package Development Handbook (DEST, August 2007). Can be downloaded from www.dest.gov.au

Assessment Resources

Training Package Assessment Guides - a range of resources to assist RTOs in developing Training Package assessment materials (originally developed by ANTA with funding from the Department of Education, Training and Youth Affairs) and made up of 10 separate titles, as described at the publications page of www.dest.gov.au. Go to www.resourcegenerator.gov.au/loadpage.asp?TPAG.htm

Printed and/or CD ROM versions of the Guides can be purchased from Technical and Vocational Education and Training (TVET) Australia Limited. The resource includes the following guides:

- Training Package Assessment Materials Kit
- Assessing Competencies in Higher Qualifications
- Recognition Resource
- Kit to Support Assessor Training
- Candidates Kit: Guide to Assessment in New Apprenticeships
- Assessment Approaches for Small Workplaces
- Assessment Using Partnership Arrangements
- Strategies for ensuring Consistency in Assessment
- Networking for Assessors
- Quality Assurance Guide for Assessment

An additional guide "Delivery and Assessment Strategies" has been developed to complement these resources.

Assessment Tool Design and Conducting Assessment

VETASSESS & Western Australian Department of Training and Employment 2000, Designing

Tests - Guidelines for designing knowledge based tests for Training Packages.

Vocational Education and Assessment Centre 1997, Designing Workplace Assessment Tools, A self-directed learning program, NSW TAFE.

Manufacturing Learning Australia 2000, Assessment Solutions, Australian Training Products, Melbourne.

Rumsey, David 1994, Assessment practical guide, Australian Government Publishing Service, Canberra.

Assessor Training

Australian Committee on Training Curriculum (ACTRAC) 1994, Assessor training program - learning materials, Australian Training Products, Melbourne.

Australian National Training Authority, A Guide for Professional Development, ANTA, Brisbane.

Australian Training Products Ltd Assessment and Workplace Training, Training Package - Toolbox, ATPL Melbourne (available from TVET).

Green, M, et al. 1997, Key competencies professional development Package, Department for Education and Children's Services, South Australia.

Victorian TAFE Association 2000, The professional development CD: A learning tool, VTA, Melbourne.

Assessment System Design and Management

Office of Training and Further Education 1998, Demonstrating best practice in VET project - assessment systems and processes, OTFE (now OTTE) Victoria.

Toop, L., Gibb, J. & Worsnop, P. Assessment system designs, Australian Government Publishing Service, Canberra.

Competency Standards

What is competency?

The broad concept of industry competency concerns the ability to perform particular tasks and duties to the standard of performance expected in the workplace. Competency requires the application of specified skills, knowledge and attitudes relevant to effective participation in an industry, industry sector or enterprise.

Competency covers all aspects of workplace performance and involves performing individual tasks; managing a range of different tasks; responding to contingencies or breakdowns; and, dealing with the responsibilities of the workplace, including working with others. Workplace competency requires the ability to apply relevant skills, knowledge and attitudes consistently over time and in the required workplace situations and environments. In line with this concept of competency Training Packages focus on what is expected of a competent individual in the workplace as an outcome of learning, rather than focussing on the learning process itself.

Competency standards in Training Packages are determined by industry to meet identified industry skill needs. Competency standards are made up of a number of units of competency each of which describes a key function or role in a particular job function or occupation. Each unit of competency within a Training Package is linked to one or more AQF qualifications.

Contextualisation of Units of Competency by RTOs

Registered Training Organisation (RTOs) may contextualise units of competency to reflect local outcomes required. Contextualisation could involve additions or amendments to the unit of competency to suit particular delivery methods, learner profiles, specific enterprise equipment requirements, or to otherwise meet local needs. However, the integrity of the overall intended outcome of the unit of competency must be maintained.

Any contextualisation of units of competency in this endorsed Training Package must be within the bounds of the following advice. In contextualising units of competency, RTOs:

- must not remove or add to the number and content of elements and performance criteria
- may add specific industry terminology to performance criteria where this does not distort or narrow the competency outcomes
- may make amendments and additions to the range statement as long as such changes do not diminish the breadth of application of the competency and reduce its portability, and/or
- may add detail to the evidence guide in areas such as the critical aspects of evidence or resources and infrastructure required where these expand the breadth of the competency but do not limit its use.

Components of Units of Competency

The components of units of competency are summarised below, in the order in which they appear in each unit of competency.

Unit Title

The unit title is a succinct statement of the outcome of the unit of competency. Each unit of competency title is unique, both within and across Training Packages.

Unit Descriptor

The unit descriptor broadly communicates the content of the unit of competency and the skill area it addresses. Where units of competency have been contextualised from units of competency from other endorsed Training Packages, summary information is provided. There may also be a brief second paragraph that describes its relationship with other units of competency, and any licensing requirements.

Employability Skills statement

A standard Employability Skills statement appears in each unit of competency. This statement directs trainers and assessors to consider the information contained in the Employability Skills Summary in which the unit of competency is packaged.

Prerequisite Units (optional)

If there are any units of competency that must be completed before the unit, these will be listed.

Application of the Unit

This sub-section fleshes out the unit of competency's scope, purpose and operation in different contexts, for example, by showing how it applies in the workplace.

Competency Field (Optional)

The competency field either reflects the way the units of competency are categorised in the Training Package or denotes the industry sector, specialisation or function. It is an optional component of the unit of competency.

Sector (optional)

The industry sector is a further categorisation of the competency field and identifies the next classification, for example an elective or supervision field.

Elements of Competency

The elements of competency are the basic building blocks of the unit of competency. They describe in terms of outcomes the significant functions and tasks that make up the competency.

Performance Criteria

The performance criteria specify the required performance in relevant tasks, roles, skills and in the applied knowledge that enables competent performance. They are usually written in passive voice. Critical terms or phrases may be written in bold italics and then defined in range statement, in the order of their appearance in the performance criteria.

Required Skills and Knowledge

The essential skills and knowledge are either identified separately or combined. Knowledge identifies what a person needs to know to perform the work in an informed and effective manner. Skills describe the application of knowledge to situations where understanding is converted into a workplace outcome.

Range Statement

The range statement provides a context for the unit of competency, describing 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. As applicable, the meanings of key terms used in the performance criteria will also be explained in the range statement.

Evidence Guide

The evidence guide is critical in assessment as it provides information to the Registered Training Organisation (RTO) and assessor about how the described competency may be demonstrated. The evidence guide does this by providing a range of evidence for the assessor to make determinations, and by providing the assessment context. The evidence guide describes:

- conditions under which competency must be assessed including variables such as the assessment environment or necessary equipment
- relationships with the assessment of any other units of competency
- suitable methodologies for conducting assessment including the potential for workplace simulation
- resource implications, for example access to particular equipment, infrastructure or situations
- how consistency in performance can be assessed over time, various contexts and with a range of evidence, and expectations at the AQF qualification level involved

Employability Skills in units of competency

The detail and application of Employability Skills facets will vary according to the job-role requirements of each industry. In developing Training Packages, industry stakeholders are consulted to identify appropriate facets of Employability Skills which are incorporated into the relevant units of competency and qualifications.

Employability Skills are not a discrete requirement contained in units of competency (as was the case with Key Competencies). Employability Skills are specifically expressed in the context of the work outcomes described in units of competency and will appear in elements, performance criteria, range statements and evidence guides. As a result, users of Training Packages are required to review the entire unit of competency in order to accurately determine Employability Skills requirements.

How Employability Skills relate to the Key Competencies

The eight nationally agreed Employability Skills now replace the seven Key Competencies in Training Packages. Trainers and assessors who have used Training Packages prior to the introduction of Employability Skills may find the following comparison useful.

Employability Skills	Mayer Key Competencies
Communication	Communicating ideas and information
Teamwork	Working with others and in teams

Problem solving	Solving problems Using mathematical ideas and techniques
Initiative and enterprise	
Planning and organising	Collecting, analysing and organising information Planning and organising activities
Self-management	
Learning	
Technology	Using technology

When analysing the above table it is important to consider the relationship and natural overlap of Employability Skills. For example, using technology may involve communication skills and combine the understanding of mathematical concepts.

Explicitly embedding Employability Skills in units of competency

This Training Package seeks to ensure that industry-endorsed Employability Skills are explicitly embedded in units of competency. The application of each skill and the level of detail included in each part of the unit will vary according to industry requirements and the nature of the unit of competency.

Employability Skills must be both explicit and embedded within units of competency. This means that Employability Skills will be:

- embedded in units of competency as part of the other performance requirements that make up the competency as a whole
- explicitly described within units of competency to enable Training Packages users to identify accurately the performance requirements of each unit with regards to Employability Skills.

This Training Package also seeks to ensure that Employability Skills are well-defined and written into units of competency so that they are apparent, clear and can be delivered and assessed as an essential component of unit work outcomes.

The following table contains examples of embedded Employability Skills for each component of a unit of competency. Please note that in the examples below the bracketed skills are provided only for clarification and will not be present in units of competency within this Training Package.

Example Employability Skills unit

Unit component	Example of embedded Employability Skill
Unit Title	Operate fluid flow equipment (organising, problem solving, technology)
Unit Descriptor	This competency covers the operation of the range of pumps and valves typically encountered in the fluid flow system of a processing plant. It includes identifying, operating, monitoring and troubleshooting these items. (planning, organising, problem solving, technology)
Element	Prepare for work (planning and organising) Respond to fluid system problems (technology, problem solving)
Performance Criteria	Coordinate with appropriate personnel (communication, teamwork) Take appropriate action (initiative and enterprise, technology, communication)
Range Statement	Following through items initiated (learning, communication, initiative and enterprise)
Required Skills and Knowledge	Recognise and resolve operational problems (technology, problem solving, learning) Take corrective action appropriate to the problem cause (initiative and enterprise, planning and organising, communication, technology, problem solving, team work)
Evidence Guide	Assessment of this unit should demonstrate competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical. (Initiative and enterprise, Learning, Planning and organising, Communication, Problem solving, Technology, Self management, Teamwork)

Competency Standards Industry Contextualisation

PMA08 – Contextualisation advice

Competency units may, and in some cases should be contextualised to the sub-sector and type of plant/process involved. Contextualisation which:

- replaces general directions with enterprise specific needs
- replaces generic equipment/process names with enterprise specific names
- replaces general processes/specifications with enterprise specific needs

is allowed and encouraged, provided the contextualised unit is of similar level and rigour to the original competency unit.

Note that contextualising cannot be used to generate an additional competency which is closely related to an existing competency. Contextualisation can only be used to generate an alternative competency for qualifications purposes.

Contextualisation may only be done if it does not significantly change the level and rigour or change the application of the unit. Contextualisation may be done within the required knowledge, range of variables and the evidence guide. Lists in these sections should be regarded as indicative lists unless otherwise stated.

Note also that contextualisation of the elements or performance criteria is not permitted. As a minimum, the contextualised unit should:

- be of similar level and rigour
- be of a similar breadth, complexity and size
- be relevant to the industry sector and the enterprise
- not reduce the health, safety or environmental requirements
- retain the original unit code and title.

Customising ‘technical (group 2)’ units

Technical (group 2) units may not be substituted with other units. Technical (group 2) units may be contextualised within the bounds specified above in this section.

Two technical units:

- MSAPMOPS200A Operate equipment
- PMAOPS300B Operate a production unit

are intended to be used primarily in a contextualised form. These two units apply to situations where no other technical (group 2) unit in the Training Package is deemed to be appropriate. OPS200 and OPS300 should be contextualised to suit individual situations, within the general contextualisation rules of this section. Again, contextualisation cannot be used to generate an additional competency which is closely related to an existing competency.

New units

Where there is no suitable equivalent unit of competency in any endorsed Training Package that can be used or contextualised to the enterprise requirements, new units may be developed and submitted to DEST via Manufacturing Skills Australia (MSA) for endorsement and inclusion in the Training Package. Any proposed new units will be treated as a ‘Category 2’ change under the DEST continuous improvement guidelines and must be endorsed by the National Quality

Council for listing on the National Training Information Service.

Importing units from other Training Packages

Competency units may be imported from another endorsed Training Package to customise a qualification. In PMA08, imported units may be used to replace the maximum number of 'support' (group 3) units only. The use of imported units is allowed if:

- they are from an endorsed Training Package packaged at an equivalent AQF level certificate (original unit code and title must be retained).
- they are appropriate to the needs of the enterprise
- any prerequisites and co-requisites specified in the original unit and any specific assessment requirements in the host Training Package are also observed

AND provided no more replacement units are used than the allowable number of support units.

Mandatory and technical units may not be substituted (however, see Contextualising technical units above). Note also that there may be units with similar outcomes from other endorsed Training Packages and that appropriate evidence of competency should be accepted to the extent that it applies to units within PMA08.

Exporting units to other Training Packages

Manufacturing Skills Australia encourages other industries and ISCs to access the units of competency in this Training Package which might be appropriate to their needs. These competencies may be used provided:

- the original unit code and title are retained
- they are only contextualised to the extent permitted above
- any specified prerequisites and co-requisites are observed
- Manufacturing Skills Australia is advised of the specific competencies to be used to facilitate ongoing communication in the event of an update.

Appendix 1 - PMA08 Glossary

In this Training Package the following terms are used with the meanings given below. These meanings may be slightly more restrictive than common usage but have been adopted to allow greater clarity and definition within this Training Package. When used in a unit of competency, these words are underlined>.

BOD	Biochemical oxygen demand - the amount of oxygen consumed by micro-organisms as they biodegrade. This is measured using a standard test over 5 days and so is called BOD5.
business sustainability	Means a business is profitable and competitive in the foreseeable future. Effective management of environmental impacts and opportunities can contribute to business sustainability by reducing

	costs, differentiating goods and services and contributing to a better corporate image.
confined space	The Australian standard definition given for confined space entry is used in this Training Package, viz: <i>an enclosed or partially enclosed space which:</i> • <i>is at atmospheric pressure during occupancy</i> • <i>is not intended or designed primarily as a place of work</i> • <i>may have restricted means for entry and exit, and</i> • <i>may:</i> (i) <i>have an atmosphere which contains potentially harmful levels of contaminant;</i> (ii) <i>not have a safe oxygen level;</i> or (iii) <i>cause engulfment.</i> Any other ‘tight spot’ has been referred to as a ‘restricted space’. Examples include: • storage tanks, tank cars, process vessels, boilers, pressure vessels, silos and other tank-like compartments • open-topped spaces such as pits or degreasers • pipes, sewers, shafts, ducts and similar structures • shipboard spaces entered through a small hatchway or access point, cargo tanks, cellular double bottom tanks, duct keels, ballast and oil tanks and void spaces (but not including dry cargo holds).
customer	Any person who is the recipient of the product or service which flows from the unit of competency. They may be internal or external to the organisation.
environmental performance	This may be defined as a measure of an organisation’s impact on the environment and of its ability to manage that impact.
FPSO	Floating production, storage and off-loading (facility/vessel)
FSO	Floating storage and off-loading (facility/vessel)

hazard	Something with the potential to cause harm. Hazards may include: • any operation that could possibly cause a catastrophic release of toxic, flammable or explosive chemicals • any action or environmental factor that could result in injury to personnel. A routine hazard is any potential hazard that needs to be identified on a regular basis. A potential hazard may or may not be associated with a high risk.
HAZCHEM	A system of labelling which codifies the hazard and the hazard control procedures for classes of chemicals. This provides simpler advice than the interpretation of toxicological data such as might be in an MSDS. However, to be effective, the hazchem system and codes need to be known.
hierarchy of control	The preferred order of risk control measures from most to least preferred, that is: • elimination • substitution • isolation • engineering controls • administrative controls • personal protective equipment.
Integral	Equipment which forms part of the operation of a main item of equipment is regarded as ‘integral’ to that main item. Examples include valves and lubricators. Typically equipment is regarded as ‘integral’ to the main item if: • it is close/attached to the main item • it has simultaneous operation with the main item • its operation does not require significant additional knowledge or skills. Equipment is not integral if it has independent operation of its own.
L _e /d	The describing of the relative head loss of a pipe fitting etc in terms of the equivalent length of straight pipe so that overall head loss can be estimated/compared

locked out	Equipment which is not to be operated for any reason may be padlocked, or otherwise prevented from operation using a keyed lock. The term 'locked out' is commonly used. A lock out may be accompanied by a tag out, or a lock out system may incorporate a tag.
LO/TO	A system requiring both a lock out and an accompanying tag.
MSDS	Material safety data sheets - all manufacturers and suppliers of chemicals are obliged to produce MSDS for each chemical. MSDS contain statements about potential hazards and the correct methods of handling to minimise the hazard.
muda	(Waste) - activities and results to be eliminated; within manufacturing, categories of waste, according to Shigeo Shingo, include: • excess production and early production • delays • movement and transport • poor process design • inventory • inefficient performance of a process • making defective items.
operability	Can be defined as any operation inside the design envelope that would cause a shutdown which could possibly lead to a violation of environmental, health or safety regulations or negatively impact on profitability.
P&ID	Piping and instrumentation drawing - a common and basic engineering drawing in this industry showing all major items of equipment and their piping linkages and the instrumentation which controls them. Different organisations may have slightly different versions of these and may use a slightly different name.
packaged	The term 'packaged' plant means an item of plant which may or may not be skid mounted and is brought in ready to operate. This is how the industry typically uses this term. It is also used in this Training Package to include

	all items of plant which are operated with minimal need to understand the operation of the unit, regardless of the size and complexity of the item itself. It also covers plant where the operation is basically restricted to turning it on and off with minimal monitoring, control and understanding of its operation by the user. Typical packaged plant may include compressors (large and small), boilers, cooling towers (where the servicing and control is outsourced), air conditioning units, etc.
pig (pigging)	A device sent through a pipeline to separate products or for pipe cleaning and maintenance. The act of sending a pig through a pipe is pigging.
place of work	Defined under the Occupational Health and Safety Regulations 2001, it is ‘premises where persons work’.
PPE	Personal protective equipment — the last line of defence against workplace hazards — includes items such as safety boots, gloves, goggles, ear muffs.
premises	Defined under the Occupational Health and Safety Regulations 2001, it includes ‘any place’, and in particular includes: • any land, building or part of any building, or • any vehicle, vessel or aircraft, or • any installation on land, on the bed of any waters or floating on any waters, or • any tent or movable structure.
prerequisites	A prerequisite unit of competency has knowledge/skills which are required to achieve a subsequent competency. In a structured training program, units with prerequisites would normally be taught after the prerequisite unit. In an assessment situation, they would often be assessed concurrently.
procedures	Includes all work instructions, standard operating procedures, formulas/recipes, batch sheets, temporary instructions and similar instructions provided for the smooth running of the plant. They may be written, verbal, computer based or in some

	other form. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
reports	Includes the filling out of forms, completing logs/log sheets, entering data into a computer based record system, noting required items on a whiteboard or communicating verbally.
risk	A 'risk' can be defined as the likelihood that harm will occur and the severity of the consequences of that harm. The more significant the risk, the more complex the risk assessment process may need to be.
risk assessment	There are different types of risk assessments: • an assessment done in an office by looking at potential hazards and operability problems as a 'one off' for a new/modified design or a periodic review of an existing plant eg using the HAZOP methodology • JSA/JHA (Job Safety Analysis/Job Hazard Analysis) – a process for systematically identifying hazards and hazard/risk controls – typically required before the issue of a permit or other similar circumstances. • possibly known as 'routine hazard identification and risk assessment' - it is live, real time and ongoing in a facility, and is conducted on a daily/hourly basis for situations that would/could have previously been identified in a 'one off' assessment. Examples of assessment tools include DuPont STOP, Hazpak.
risk register	A register of all identified risks and documentation of the strategies/plans in place to deal with any event/incident that might occur.
semi-bulk	A generic industry term used to describe large containers such as bulker boxes and pallecons, which may be known by their brand name within a company. These containers, which may store around a tonne of material are larger than normal containers but are not bulk. They are a common delivery more and may also be used for

	intermediate storage.
senses	The use of the senses of sight, hearing, smell and where appropriate touch. Taste would rarely, if ever, be an appropriate sense in this context.
tagged out	Equipment not to be operated for any reason will carry a 'tag' indicating this and so the term 'tagged out' is commonly used. A tag out may be accompanied by a lock out, or a lock out may be used to replace a tag out.
triple bottom line principles	Can be defined as the integration of environmental, commercial and social aspects of business operations.
utilities	Utilities is used to mean: • steam (saturated and/or superheated) • air (instrument, safety, process and/or mechanical) • water (cooling and/or process) • fuel (gas, oil) • other heating/cooling mediums (oil, 'Dowtherm', brine) • electricity • inerting/purging agents such as nitrogen or steam.
workplace	See 'place of work'.

Appendix 2 - List of Contributors

1. Interest groups: permits/panel operators/packaging rules

First name	Second name	Organisation	State	Packaging rules	Panel	Permits
Craig	Connor	Alinta	NSW		X	X
Joe	Calabrese	Alinta	NSW	X		
Leslie	Faulstone	MECAT	NSW	X		
Celeste	Howden	MLA	NSW	X		

Leanne	Reid	Qenos	NSW		X	X
Brendan	Rounds	S C Johnson	NSW			
John	Gardner	Shell, Clyde	NSW			X
Kim	Peterson	TAFE NSW	NSW	X		
Rob	Armstrong	Conoco Phillips	NT			
Geoff	Teale	BP Refining	Qld		X	X
Peter	Claughton	Central TAFE, Gladstone	Qld	X		
Lee	Baker	Incitec Pivot Ltd	Qld			X
Stuart	Hansford	Rio Tinto	Qld			
Wolfie	Baart	Santos	SA		X	X
Daniel	Stevens	Safetec Enterprises	Tas	X		
Trevor	Lange		Vic	X		
John	Molenaar		Vic	X	X	
Jenny	Smith	AGR Asia Pacific	Vic			
Chris	Dafter	Alinta	Vic		X	
Michael	Grout	Australian Vinyls	Vic		X	
Eddie	Hoyer	Bassell	Vic		X	
Tony	O'Donnell	Box Hill TAFE	Vic		X	
Paul	McIntyre	Esso	Vic		X	X
John	Jarvis	Esso	Vic		X	
Marie	Vassallo	Futurum Australia	Vic	X		
Patrick	Boland	Gordon Institute of TAFE	Vic	X		
Bill	Walley	Gordon TAFE	Vic		X	
David	Graham	Huntsman Chemical	Vic		X	
Phillip	Murphy	Nufarm	Vic		X	

Helen	Daniel	Orica Laverton	Vic		X	
Judy	Douglas	Qenos	Vic		X	
Don	Potter	Qenos	Vic		X	
Stephen	Gravolin	Shell	Vic		X	
Stuart	Hall	Shell	Vic		X	
Glen	Butterworth	Shell Geelong Refinery	Vic			X
Peter	Hancock	Workplace Initiatives	Vic		X	
Steve	Rogers		WA			X
Bill	Hamlet	Bunbury TAFE	WA	X		
Alex	Harrison	Central TAFE, Gladstone	WA	X		
Alan	Latto	Chevron	WA			X
Glenn	Iles	ERG Training	WA	X		
Sam	Zacha	MOXI skills + learning	WA	X		
Ron	Baker	TCC Group Skills Training	WA	X		
Grant	O'Keefe	Wild Geese International	WA	X		
Allan	Hill	Woodside	WA		X	
Ross	Trainer	Woodside Energy	WA	X		

2. Phase 2 participants

First Name	Second Name	Organisation	Sector	state
Rebecca	Lee	Bayer Australia Limited	Paint	NSW
Bill	Berwick	BML Worksafe Solutions	RTO	NSW
Dorothy		BOC	Gas	NSW
Ross	Huggett	BOC Limited	Gas	NSW

Peter	Re	BOC Limited	Gas	NSW
Paul	Farrell	Caltex Refineries	Oil	NSW
Celeste	Howden	Manufacturing Learning Australia	RTO	NSW
Brendan	Rounds	S C Johnson	small	NSW
John	Gardner	Shell Clyde Refining	Oil	NSW
Greg	Martin	Shell Clyde Refining	Oil	NSW
Leslie	Faulstone	TAFE NSW	RTO	NSW
Patrick	O'Flannery	Thales Australia (ADI)	Chem	NSW
Sarah	Veale	Workstar	RTO	NSW
Sue	Bartlett		Paint	NSW
Peter	Burkhard	Charles Darwin University	RTO	NT
Michael	Hatfield	ConocoPhillips (91-12) Pty Ltd	Hyd	NT
Alison	Smith	ConocoPhillips (91-12) Pty Ltd	Hyd	NT
David	Coleman	Coogee Resources	Hyd	NT
Karlo	Terz	InterOil Products LTD	Oil	PNG
Antonio	Alejandro	LGL Oxygen Plant	Gas	PNG
Luke	Miller	LGL Oxygen Plant	Gas	PNG
Geoff	Teale	BP Refining	Oil	Qld
Keith	Butler	Central Queensland Institute of TAFE	RTO	Qld
Lee	Baker	Incitec Pivot Ltd	Chem	Qld
David	Brown	Origin Energy	Hyd	Qld
Eric	Sheehan	QFRA	RTO	Qld
Paul	Hughes	Signet Pty Ltd	Paint	QLD
Graham	Macgowan	Further Education Employment Science & Technology	STA	SA
Robert	Baxter	KD Fisher & Co Pty Ltd	RTO	SA

Tony	Beer Smith	KD Fisher & Co Pty Ltd	RTO	SA
Sidney	Bowring	KD Fisher & Co Pty Ltd	RTO	SA
John	Corstens	KD Fisher & Co Pty Ltd	RTO	SA
Andrew	Goold	KD Fisher & Co Pty Ltd	RTO	SA
Wolfie	Baart	Santos	Hyd	SA
Ken	Rhodes	Santos	Hyd	SA
Lina	Dickens		Hyd	Sin
Jenny	Smith	AGR Asia Pacific	Chem	Vic
Chris	Dafter	Alinta	Hyd	Vic
Michael	Grout	Australian Vinyls	Chem	Vic
Eddie	Hoyer	Bassell	Chem	Vic
Barry	Tomlin	Bassell	Chem	Vic
Tony	O'Donnell	Box Hill TAFE	RTO	Vic
Kristain	Leszczyski	CSR Ethanol	Chem	Vic
Margaret	Flynn	East Gippsland Institute of TAFE -	RTO	VIC
John	Jarvis	Esso	Hyd	Vic
Pat	Boland	Gordon TAFE	RTO	Vic
Bill	Walley	Gordon TAFE	RTO	Vic
David	Graham	Huntsman Chemicals	Chem	Vic
Michael	Whitely	Jasol	Chem	Vic
John	Molenaar	Manufacturing and Engineering Skills	ITAB	Vic
Herb	Pride	Mobil Altona Refinery	Oil	VIC
Phillip	Murphy	Nufarm Australia Ltd	Chem	Vic
Tina	Berghella	OGGI Consulting	Con	Vic
Helen	Daniel	Orica Laverton	Chem	Vic
Eddie	Hargrave	OTTE	STA	Vic

Bill	Norris	OTTE	STA	Vic
Lisa	Afxendis	PZ Cussons	Chem	Vic
Johnathon	Clancy	Qenos	Chem	Vic
Julie	Crushaw	Qenos	Chem	Vic
Judy	Douglas	Qenos	Chem	Vic
Don	Potter	Qenos	Chem	Vic
Stephen	Gravolin	Shell	Oil	Vic
Glen	Butterworth	Shell Geelong Refinery	Oil	VIC
Stuart	Hall	Shell Refining Geelong	Oil	Vic
Colin	Davis	Sustainable Infrastructure Australia	RTO	Vic
Trevor	Lange	TAFE VIC	RTO	Vic
Paul	Quinane	Thales Australia (ADI)	Chem	Vic
Mike	Valentine	Victoria university	RTO	Vic
Peter	Hancock	Workplace Initiatives	RTO	Vic
Craig	Connor	Alinta Asset Management 3 Pty Ltd	Hyd	WA
Steve	Rogers	Apache Energy	Hyd	WA
Tim	McGrath	Australian Petroleum Production & Exploration Association Limited	Assoc	WA
Dorothy	Sinclair	Central TAFE	RTO	WA
Alex	Harrison	Central TAFE, Leederville Campus	RTO	WA
Allyn	Cooper	Chevron Australia Pty Ltd	Hyd	WA
Mike	Jakins	Chevron Australia Pty Ltd	Hyd	WA
Alan	Latto	Chevron Australia Pty Ltd	Hyd	WA
Ian	Stephenson	Conoco Phillips	Hyd	WA
Neville	Carrington	ConocoPhillips (91-12) Pty Ltd	Hyd	WA
Rosa Maria	Iuliano	Department of Education and Training	STA	WA

(Rosemarie)		(DET)		
James	Kernaghan	ENI Australia	Hyd	WA
Martin	Ralph	IFAP	RTO	WA
Sam	Zacha	MOXI skills + learning	RTO	WA
Jo	Nobelius	Nobelius Consulting		WA
Garry	Round	Skills Training & Assessment Centre	RTO	WA
Kamal	Haddad	Skills Training and Engineering Services(50091)	RTO	WA
Lisa	Chegwidden	wapl	Chem	WA
Grant	O'Keefe	Wild Geese International	RTO	WA
Ross	Trainer	Woodside Energy	Hyd	WA
Annie	Archer	Rio Tinto	Chem	WA
Garry	Eglinton	CINA	Hyd	WA

3. Phase 1 Participants

First Name	Second name	Organisation	Sector	State
Michele	Kissin	Vertical Horizonz Australia	RTO	Qld
Jeff	Butler	Incitec	Chemical	Qld
Alan	Bartlett	Alan Bartlett Consulting	Chemical	Qld
Morrie	Bellaver	Queensland DET	STA	Qld
Roger	Cater	Chemical ITC	ITAB	Qld
Peter	Claughton	Central TAFE, Gladstone	RTO	Qld
Darren	Radel	Central TAFE, Gladstone	RTO	Qld
Brian	Davey	Central TAFE, Gladstone	RTO	Qld
Leigh	Gowler	Comalco Aluminium Refinery	Smelting	Qld

Wendy	Beale	Queensland Alumina	Smelting	Qld
Bruce	Oppel	Orica, Yarwun	Chem	Qld
Paul	Brooks	Incitec Pivot	Chem	Qld
Malcolm	Campbell	Consultant, QMITB	ITAB	Qld
Terri	Pienaar	Boyne Smelter Ltd	Smelting	Qld
Anne	Porter	Boyne Smelter Ltd	Smelting	Qld
Warren	Dredge	Boyne Smelter Ltd	Smelting	Qld
Johan	Peenz	Boyne Smelter Ltd	Smelting	Qld
Stuart	Hansford	Rio Tinto Aluminium Limited	Smelting	Qld
Wendy	Beale	Queensland Alumina	Smelting	Qld
Carolyn	Paul	HPG Consulting	RTO	Qld
Gary	Sears	Hydratight	Consultant	Qld
Tony	O'Donnell	Box Hill Institute	RTO	Vic
Bill	Walley	Box Hill Institute	RTO	Vic
Marie	Vassallo	Futurum Australia	RTO	Vic
John	Molenaar	MESAB	ITAB	Vic
Liz	Stafford	OTTE	STA	Vic
Wayne	Harris	Exxon Mobil, Altona	Oil	Vic
Herb	Pride	Exxon Mobil, Altona	Oil	Vic
Pat	Boland	Gordon Institute of TAFE	RTO	Vic
Jenny	Smith	Upstream Petroleum	Hyd	Vic
Vince	Lloyd	Qenos (AWU)	Chem	Vic
David	Graham	Huntsman Chemical	Chem	Vic
Alan	Bugg	Huntsman Chemical	Chem	Vic
Michael	Grout	Australian Vinyls	Chem	Vic
David	Benson	Holmesglen Institute of TAFE	RTO	Vic

Paul	McIntyre	Esso Australia Pty Ltd	Oil	Vic
Mike	Valentine	Jobs Plus	NAC	Vic
Peter	Wakefield	Newskills	RTO	Vic
Trevor	Lange	Chisholm Institute	RTO	Vic
Vin	Tully	DIMIA	Govt	Vic
Brett	Noonan	Alcoa Point Henry	Smelting	Vic
Andrew	Morphett	Alcoa Point Henry	Smelting	Vic
Bob	Bryden	In-Train	RTO	Vic
Jane	Noonan	Red Alert	RTO	Vic
Kim	Peterson	MECAT, TAFE NSW	RTO	NSW
Joe	Calabrese	Agility Training	RTO	NSW
Eddie	Beveridge	Shell Refining	Oil	NSW
Quinton	Weston	Shell Refining	Oil	NSW
Andrew	George	TAFE NSW	RTO	NSW
Mostafa	Choudhury	TAFE NSW	RTO	NSW
Mike	McLeay	MD & Associates	RTO	NSW
Leanne	Reid	Qenos	Chem	NSW
Lisa	James	Caltex Refineries	Oil	NSW
Ravi	Bindiga	Qenos	Chem	NSW
Garry	Whitaker	Orica Explosives	Chem	NSW
Stephen	Holland	PACIA	Assoc	NSW
Sean	Le	NSW DET	STA	NSW
Celeste	Howden	MLA	ITAB	NSW
John	Lamont	Nowra Chemical Manufacturers	Small	NSW
Deb	Doherty	OPCET	STA	Tas
Colin	Berry	Tasmanian Alkaloids	RTO	Tas

Matthew	Double	Zinifex Hobart Smelter	RTO	Tas
Bill	Fitzgerald	Australian Mines & Metals Assoc	RTO	Tas
Brian	Hevey		STA	Tas
Daniel	Stevens	Safetec Enterprises	RTO	Tas
Max	Thompson	Aust Employment Services	RTO	Tas
	Davis	SUSTAINABLE INFRASTRUCTURE AUSTRALIA	RTO	
Colin				Vic
Tim	McGrath	Australian Petroleum Production & Exploration Association Limited	Assoc	WA
Martin	Ralph	IFAP	RTO	WA
Brian	Acreman	ACEPT	RTO	WA
J	Dunne	ACEPT	RTO	WA
M	Nelson	ACEPT	RTO	WA
Mike	Jakins	Chevron Australia Pty Ltd		WA
Trevor	Tyers	ACEPT	RTO	WA
Ron	Baker	TCC Group Skills Training	RTO	WA
Glenn	Iles	ERG Training	RTO	WA
Chris	Busing	ERG Training	RTO	WA
Geoffrey	Graham	Geographe Energy	Chem	WA
Barry	Shackles	BP Refinery Kwinana	Oil	WA
A	Jones	BP Refinery Kwinana	Oil	WA
Ian	Vincent	Fire & Emergency Services Auth	Govt	WA
Ian	Eldred	Fire & Emergency Services Auth	Govt	WA
Roy	Hebden	Fire & Emergency Services Auth	Govt	WA
Kevin	Davis	Transfield Worley	Hyd	WA
Ian	Cahill	WAPL	Hyd	WA

Rob	Armstrong	Origin Energy	Hyd	Qld
Bill	Hamlet	Bunbury TAFE	RTO	WA
Ian	Wynn	Bunbury TAFE	RTO	WA
Ivor	Alexander	Apache	Hyd	WA
Robert	Lonie	Shell	Hyd	WA
Peter	Gipson	Woodside	Hyd	WA
Allan	Hill	Woodside Energy Ltd.	Hyd	WA
Sean	Blake	Woodside	Hyd	WA
Keith	Mackintosh	Wesfarmers LPG	Hyd	WA
David	Arnold	Alcoa	Chem	WA
Mary-Lou	Barry	Millennium Chemical	Chem	WA
Colin	Merritt	ANTCER	NAC	WA
Steve	Starling	ANTCER	NAC	WA
Don	Sanders	APPEA	Assoc	WA
Peter	Agnew	Orica Mining Services	Chem	WA
Lisa	Chegwidden	Worsley Alumina	Chem	WA
Jo	Nobelius	Nobelius Consulting	Consultant	WA
Wayne	Mason	Santos	Hyd	SA
Gordon	Moseby	Beach Petroleum Ltd	Oil	SA
Lina	Dickins	Santos	Hyd	SA
Ken	Rhodes	Santos	Hyd	SA
Woolfie	Baart	Santos	Hyd	SA
Sherelee	Rose	DFEEST	STA	SA
Rachel	Munich	NT ETAB	STA	NT
Tim	Schinkel	Major Industries TAC	ITAB	NT
Jeannie	Cotterell	ACT DET	STA	ACT

PMA20113 Certificate II in Process Plant Operations

Modification History

Release 2 - ISC upgrade - Addition of industry sector and occupation data to taxonomy fields.

Description

The PMA20113 Certificate II in Process Plant Operations has been developed as a technical qualification for use in the PMA08 Chemical, Hydrocarbons and Refining Training Package.

Job roles/employment outcomes

The PMA20113 Certificate II in Process Plant Operations is intended for competent operators who operate production equipment or undertake similar roles directly producing products. The operator would apply a breadth and depth of knowledge to a defined range of situations and would be expected to apply this knowledge to solve a defined range of problems by applying known solutions to a limited range of predictable problems.

Other non-technical Certificates II are available for production support employees at this level, such as MSA20107 Certificate II in Process Manufacturing. This certificate should be used where the job requirements do not allow for the development of competency in sufficient technical units of competency. The MSA21108 Certificate II in Competitive Manufacturing is also available for employees at this level where the job requires sophisticated manufacturing practice skills rather than technical skills.

Application

This qualification is typically used to prepare new employees or develop existing workers performing an operational role in the chemical, hydrocarbons or refining sectors.

Operators may specialise in one of the following sectors:

- fine chemicals
- heavy chemicals
- petrochemicals
- polymer manufacture
- hydrocarbon extraction
- hydrocarbon transmission
- hydrocarbon processing/refining
- minerals processing/refining

- metalliferous processing/refining
- metals smelting/processing
- other related areas.

Specialisations must be reflected by the selection of units identified for specialised streams.

Training programs for this qualification are suitable to be undertaken as part of a formal training contract with an employer under an Australian Traineeship or Apprenticeship arrangement.

Pathways Information

Pathways into the qualification

This qualification may be accessed by direct entry. Credit may be granted towards this qualification by those who have completed MSA10207 Certificate I in Process Manufacturing in the MSA07 Manufacturing Training Package or other relevant qualifications. Credit for this qualification may also include units contained within relevant Skill Sets.

Pathways from the qualification

Further training pathways from this qualification include PMA30113 Certificate III in Process Plant Operations, MSA30107 Certificate III in Process Manufacturing, MSA31108 Certificate III in Competitive Manufacturing, MSA30208 Certificate III in Manufacturing Technology or other relevant qualifications.

Additional qualification advice

An industry specialisation should include a range of units (typically production or other units relevant to the specialisation) that focus more on the industry speciality than a generic qualification.

An industry specialisation does not change the title of the qualification although RTOs may choose to record the specialisation.

MSA20107 Certificate II in Process Manufacturing from the MSA07 Manufacturing Training Package is available for production support employees at this level and should be used where the job requirements do not allow for the development of competency in sufficient technical units of competency.

MSA21108 Certificate II in Competitive Manufacturing is available for employees at this level who already possess technical skills and who require additional manufacturing practice skills above those available in this qualification.

Licensing/Regulatory Information

There are no specific licences that relate to this qualification. However, in some jurisdictions some units in this qualification may have licensing or regulatory requirements. Local regulations should be checked for details.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• complete logs and reports • use technical information and manufacturer's information • collect, analyse and organise information • communicate ideas and information • effective use of workplace documentation • maintain workplace records
Teamwork	• identify and describe own role and role of other • work within a team • resolve conflicts between team members • teamwork strategies
Problem-solving	• recognise a problem or a potential problem related to a plant item • determine problems needing priority action • refer problems outside area of responsibility to appropriate person, with possible causes • seek information and assistance as required to solve problems • solve problems within area of responsibility related to plant items • follow through items initiated until final resolution has occurred

Initiative and enterprise	• identify and isolate faults in equipment • use a range of formal problem solving techniques • identify the most appropriate equipment/plant item • make adjustments to improve equipment/item performance • anticipate the impact of the process on the product • determine problems needing action • recommend required action • report problems outside area of responsibility • distinguish between causes of faults
Planning and organising	• plan own work requirements • plan scope of equipment/plant item checks • plan and organise activities • identify tasks to achieve team goals • organise allocation of tasks • monitor completion of allocated tasks • organise work according to a production schedule
Self-management	• plan own work requirements from production requests • operate within appropriate time constraints and work standards • select and use appropriate equipment, materials, processes and procedures • plan to ensure effective production • apply workplace procedures • identify resource requirements, document and monitor • recognise limitations and seek timely advice
Learning	• ask questions to gain information • identify sources of information to expand knowledge and understanding • participate in improvement procedures • participate in development of continuous improvement strategies
Technology	• operation and adjustment of processes • start up and shut down equipment/plant items • set up equipment/plant items • monitor product/process quality • function and operating principles of equipment, machine components • maintain workplace records

Packaging Rules

To be awarded the PMA20113 Certificate II in Process Plant Operations competency must be achieved in sixteen (16) units of competency:

- five (5) core units of competency
- eleven (11) elective units of competency chosen as specified below

Note

Where prerequisite units apply, these must be considered in the total number of units chosen.

Core units of competency

Unit code	Unit title
MSAENV272B	Participate in environmentally sustainable work practices
MSAPMOHS110A	Follow emergency response procedures
MSAPMOHS200A	Work safely
MSAPMSUP100A	Apply workplace procedures
MSAPMSUP102A	Communicate in the workplace

Elective units of competency

Select **eleven (11)** units as specified below:

- A minimum of **four (4)** from Group A

The remainder may be chosen from Groups A, B and C (with a maximum of **five (5)** from Group C) to bring the total number of electives to **eleven (11)**.

Note that **three (3)** of the Group C units can be chosen from other qualifications in this Training Package, other endorsed Training Packages and accredited courses, where those units are available at Certificate II.

Group A - Specialist electives

Unit code	Unit title	Prerequisites
PMAOPS201B	Operate fluid flow equipment	
PMAOPS202B	Operate fluid mixing equipment	
PMAOPS203B	Handle goods	
PMAOPS204B	Use utilities and services	
PMAOPS205B	Operate heat exchangers	
PMAOPS208B	Operate chemical separation equipment	
PMAOPS210B	Operate particulates handling equipment	
PMAOPS211B	Operate manufacturing extruders	
PMAOPS213B	Package product/material	
PMAOPS216B	Operate local control system	
PMAOPS217B	Operate wet milling equipment	
PMAOPS220B	Monitor chemical reactions in the process	
PMAOPS221B	Operate and monitor prime movers	
PMAOPS222B	Operate and monitor pumping systems and equipment	*
PMAOPS223B	Operate and monitor valve systems	
PMAOPS224B	Provide fluids for utilities and support	
PMAOPS230B	Monitor, operate and maintain pipeline stations and equipment	
PMAOPS231B	Control gas odourisation	
PMAOPS232B	Produce product by filtration	
PMAOPS233A	Monitor wells and gathering systems	
PMAOPS234A	Monitor and operate low pressure compressors	

PMAOPS240B	Store liquids in bulk	
PMAOPS241A	Operate Joule-Thomson effect device	
PMAOPS242A	Moor ships for transfer of bulk processed particulates or fluids	
PMAOPS246A	Operate separation equipment	
PMAOPS247A	Operate powered separation equipment	
PMAOPS260A	Conduct screening operations	
PMAOPS261A	Operate bulk solids loading equipment	
PMAOPS262A	Operate digestion equipment	
PMAOPS263A	Operate leaching equipment	
PMAOPS264A	Operate solvent extraction equipment	
PMAOPS265A	Operate magnetic/electrical separation equipment	
PMAOPS280B	Interpret process plant schematics	
PMAOPS290B	Operate a biotreater	
PMASMELT260B	Form carbon anodes	
PMASMELT261B	Bake carbon anodes	
PMASMELT262B	Clean and strip anode rods	
PMASMELT263B	Spray carbon anodes	
PMASMELT264B	Start up reduction cells	
PMASMELT265B	Operate reduction cells	
PMASMELT266B	Deliver molten metal	
PMASMELT267B	Cast aluminium ingots	
PMASMELT268B	Vertical direct casting	
PMASMELT269A	Operate cell tending equipment	
PMASMELT270A	Supply product from reduction cells	

FDFPH2001A	Apply Good Manufacturing Practice procedures	
MEM04001B	Operate melting furnaces	
MSAPMOPS200A	Operate equipment	
MSAPMOPS212A	Use enterprise computers or data systems	
PMC552002C	Operate equipment to blend/mix materials	
PMC552003C	Operate grinding equipment	
PMC552008B	Operate crushing equipment	
PMC562070B	Move materials	
UEPOPS319B	Operate and monitor gas production plant	

One (1) unit may be chosen from Group A in PMA30113 Certificate III in Process Plant Operations

Group B

Unit code	Unit title	Prerequisites
MEM05012C	Perform routine manual metal arc welding	
MEM09002B	Interpret technical drawing	
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	
MSS402002A	Sustain process improvements	
MSS402030A	Apply cost factors to work practices	
MSS402031A	Interpret product costs in terms of customer requirements	
MSS402040A	Apply 5S procedures	

MSS402050A	Monitor process capability	
MSS402051A	Apply quality standards	
MSS402060A	Use planning software systems in operations	
MSS402080A	Undertake root cause analysis	
MSS402081A	Contribute to the application of a proactive maintenance strategy	
MSAPMOHS205A	Control minor incidents	
MSAPMOHS210B	Undertake first response to non-fire incidents	
MSAPMOHS212A	Undertake first response to fire incidents	
MSAPMOHS216A	Operate breathing apparatus	
MSAPMOHS217A	Gas test atmospheres	
MSAPMOHS220A	Provide initial first aid response	
MSAPMPER200C	Work in accordance with an issued permit	
MSAPMPER201A	Monitor and control work permits	
MSAPMPER202A	Observe permit work	*
MSAPMPER205C	Enter confined space	*
MSAPMSUP200A	Achieve work outcomes	
MSAPMSUP201A	Receive or despatch goods	
MSAPMSUP204A	Pack products or materials	
MSAPMSUP205A	Transfer loads	
MSAPMSUP210A	Process and record information	
MSAPMSUP240A	Undertake minor maintenance	
MSAPMSUP280A	Manage conflict at work	
MSAPMSUP291A	Participate in continuous improvement	
MSAPMSUP292A	Sample and test materials and product	

MSL952001A	Collect routine site samples	
PMAOHS211B	Prepare equipment for emergency response	
PMAOHS213B	Undertake fire control and emergency rescue	
PMAOHS214B	Undertake helicopter safety and escape	
PMAOHS215B	Apply offshore facility abandonment and sea survival procedures	
PMAOHS221B	Maintain first aid supplies and records	
PMAOMIR210B	Control evacuation to muster point	
PMASUP236B	Operate vehicles in the field	
PMASUP237B	Undertake crane, dogging and load transfer operations	
PMASUP241B	Maintain pipeline easements	
PMASUP242B	Monitor pipeline civil works	
PMASUP243B	Monitor and maintain pipeline coatings	
PMASUP244A	Prepare and isolate plant	
RIIOHS204A	Work safely at heights	
RIIRIS201B	Conduct local risk control	
TLID2010A	Operate a forklift	

Group C

Unit code	Unit title	Prerequisites
FDFPH1001A	Follow work procedures to maintain Good Manufacturing Practice	
MEM11011B	Undertake manual handling	
MSAPMOHS100A	Follow OHS procedures	

MSAPMOPS100A	Use equipment	
MSAPMOPS102A	Perform tasks to support production	
MSAPMSUP101A	Clean workplace or equipment	
MSAPMSUP106A	Work in a team	
MSAPMSUP172A	Identify and minimise environmental hazards	
PMAOPS101C	Read dials and indicators	
PMAOPS105C	Select and prepare materials	

Up to **three (3)** relevant units may be selected from this Training Package, other endorsed Training Packages and accredited courses where those units are available at Certificate II.

Custom Content Section

Not applicable.

PMA30113 Certificate III in Process Plant Operations

Modification History

Release 2 – ISC upgrade - Addition of industry sector and occupation data to taxonomy fields.

Description

The PMA30113 Certificate III in Process Plant Operations has been developed as a technical qualification for use in the PMA08 Chemical, Hydrocarbons and Refining Training Package.

Job roles/employment outcomes

The PMA30113 Certificate III in Process Plant Operation is intended for advanced operators and operations technicians who use production equipment to directly produce products. At this level, operators/technicians would undertake more advanced operations, typically of integrated plant units in accordance with the operating procedures, and would apply their knowledge to anticipate problems. They would be expected to solve a range of foreseen and unforeseen problems, using product and process knowledge to develop solutions to problems which do not have a known solution, or a solution recorded in the procedures.

The MSA30107 Certificate III in Process Manufacturing is available for production support employees at this level and should be used where the job requirements do not allow for the development of competency in sufficient technical units of competency. The Certificate III in MSA31108 Competitive Manufacturing is available for employees at this level where the job requires sophisticated manufacturing practice skills rather than technical skills.

Application

This qualification is typically used to develop employees performing an advanced operational role that includes an ability to work independently and conduct technical problem solving according to the needs of the work in the chemical, hydrocarbons or refining sectors.

Operators may specialise in one of the following areas:

- fine chemicals
- heavy chemicals
- petrochemicals
- polymer manufacture
- hydrocarbon extraction
- hydrocarbon transmission
- hydrocarbon processing/refining
- minerals processing/refining

- metalliferous processing/refining
- metals smelting/processing
- other related areas.

Specialisations must be reflected by the selection of units identified for specialised streams.

Training programs for this qualification are suitable to be undertaken as part of a formal training contract with an employer under an Australian Traineeship or Apprenticeship arrangement.

Pathways Information

Pathways into the qualification

This qualification may be accessed by direct entry. Credit may be granted towards this qualification by those who have completed MSA20107 Certificate II in Process Manufacturing, PMA20113 Certificate II in Process Plant Operations or other relevant qualifications. Credit for this qualification may also include units contained within relevant skill sets.

Pathways from the qualification

Further training pathways from this qualification include PMA40110 Certificate IV in Process Plant Technology, MSA41108 Certificate IV in Competitive Manufacturing or MSA40108 Certificate IV in Manufacturing Technology or other relevant qualifications.

Additional qualification advice

An industry specialisation should include a range of units (typically production or other units relevant to the specialisation) that focus more on the industry speciality than a generic qualification.

MSA30107 Certificate III in Process Manufacturing, in the MSA07 Manufacturing Training Package is available for production support employees at this level and should be used where the job requirements do not allow for the development of competency in sufficient technical units of competency.

MSA31108 Certificate III in Competitive Manufacturing is available for employees at this level who already possess technical skills and who require additional manufacturing practice skills above those available in this qualification.

Licensing/Regulatory Information

There are no specific licences that relate to this qualification. However, in some jurisdictions some units of competency in this qualification may have licensing or regulatory requirements. Local regulations should be checked for details.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• maintain communication about multiple subjects and with multiple audiences • complete incident and other reports • use technical information and manufacturer's information • collect, analyse and organise information • communicate ideas and information • use and contribute to workplace documentation • maintain workplace records
Teamwork	• identify and describe own role and role of other • work within a team • resolve conflicts between team members • teamwork strategies
Problem-solving	• recognise a problem or a potential problem in a plant unit, system or area • determine problems needing priority action • refer problems outside area of responsibility to appropriate person, with possible causes • identify appropriate theory base for problem • seek information and assistance as required to solve problems • solve problems within area of responsibility for plant unit, system or area • follow through items initiated until final resolution has occurred • identify and isolate faults in equipment • use a range of formal problem solving techniques
Initiative and enterprise	• identify the most appropriate process conditions for unit, system or area

- make adjustments to improve performance of unit, system or area
 - anticipate the impact of the process on the product and other process areas
 - determine problems needing action
 - recommend required action
 - report problems outside area of responsibility
 - distinguish between causes of faults
- Planning and organising**
- prioritise actions to achieve required outcomes for unit, system or area
 - plan own work requirements and assist others to plan theirs
 - plan scope of unit, system or plant area checks
 - plan and organise activities
 - identify tasks to achieve team goals
 - organise allocation of tasks
 - monitor completion of allocated tasks
 - develop and adjust a production schedule
- Self-management**
- plan own work requirements from production requests
 - operate within appropriate time constraints and work standards
 - select and use appropriate equipment, materials, processes and procedures
 - plan to ensure effective production
 - apply workplace procedures
 - identify resource requirements, document and monitor
 - recognise limitations and seek timely advice
- Learning**
- ask questions to gain information
 - identify sources of information to expand knowledge and understanding
 - participate in improvement procedures
 - participate in development of continuous improvement strategies
 - helps others develop competency
- Technology**
- operation and adjustment of unit, system or plant area processes
 - start up and shut down unit, system or plant area
 - set up unit, equipment or plant area
 - monitor product/process quality
 - function and operating principles of unit, system or plant area
 - maintain workplace records

Packaging Rules

To be awarded the PMA30113 Certificate III in Process Plant Operations competency must be achieved in **twenty one (21)** units of competency chosen:

- **five (5)** core units of competency
- **sixteen (16)** elective units of competency as specified below.

Note Where prerequisite units apply, these must be considered in the total number of units chosen.

Core units of competency

Unit code	Unit title
MSAENV272B	Participate in environmentally sustainable work practices
MSAPMOHS110A	Follow emergency response procedures
MSAPMOHS200A	Work safely
MSAPMSUP100A	Apply workplace procedures
MSAPMSUP102A	Communicate in the workplace

Elective units of competency

Select **sixteen (16)** units as specified below:

- A minimum of **two (2)** from Group A
- The remainder may be chosen from Groups A, B and C (with a maximum of **twelve (12)** from Group C) to bring the total number of electives to **sixteen (16)**.

Note that up to **four (4)** of the elective units can be chosen from other qualifications in this Training Package, other endorsed Training Packages and accredited courses, as specified in Groups B and C.

Group A – Specialist electives

Unit code	Unit title	Prerequisites
PMAOMIR305A	Operate panel during an emergency	*
PMAOPS300B	Operate a production unit	
PMAOPS301B	Produce products by distillation	*
PMAOPS302B	Operate reactors and reaction equipment	
PMAOPS303B	Operate furnaces to induce reaction	
PMAOPS304B	Operate and monitor compressor systems and equipment	*
PMAOPS305B	Operate process control systems	
PMAOPS307B	Transfer bulk fluids into/out of storage facility	*
PMAOPS308B	Organise storage and logistics of general materials	
PMAOPS309B	Operate particulates handling/ storage equipment	
PMAOPS312B	Undertake ship loading/unloading operations	
PMAOPS319A	Adjust batch	
PMAOPS320B	Conduct artificial lift	
PMAOPS321B	Undertake well management	
PMAOPS323A	Operate and monitor heating furnace	
PMAOPS324A	Operate a gas turbine	
PMAOPS325B	Generate electrical power	
PMAOPS326B	Produce product using gas absorption	
PMAOPS327B	Produce product using fixed bed dehydration	
PMAOPS329B	Produce product using liquid extraction	
PMAOPS330B	Communicate pipeline control centre operations	
PMAOPS333A	Operate wells and gathering systems	

PMAOPS335A	Conduct pipeline pigging	
PMAOPS340B	Operate cryogenic processes	
PMAOPS350B	Match and adjust colour	
PMAOPS390B	Operate a biochemical process	
PMAOPS360A	Operate a metalliferous kiln/furnace	
PMAOPS361A	Operate a smelting furnace	
PMAOPS362A	Operate a blast furnace	
PMAOPS364A	Operate an electrochemical process	
PMAOPS365A	Operate pelletising equipment	
PMAOPS366A	Operate sintering equipment	
PMAOPS460A	Monitor and operate tailings management facilities	
FDFPHGMP3A	Monitor the implementation of Good Manufacturing Practice procedures	
MEM07033B	Operate and monitor basic boiler	
MEM07034A	Operate and monitor intermediate class boiler	*
MEM18011C	Shutdown and isolate machine	
NWP357B	Monitor, operate and control reverse osmosis and nano-filtration processes	
UEPOPS340B	Operate and monitor a steam turbine	

One (1) unit may be chosen from Group A in PMA40113 Certificate IV in Process Plant Technology.

Group B

Unit code	Unit title	Prerequisites
MEM09003B	Prepare basic engineering drawing	*

MSAPMOHS300A	Facilitate the implementation of OHS for a work group	*
MSAPMPER300C	Issue work permits	*
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	*
MSAPMSUP301A	Apply HACCP to the workplace	
MSAPMSUP303A	Identify equipment faults	
MSAPMSUP309A	Maintain and organise workplace records	
MSAPMSUP310A	Contribute to development of plant documentation	
MSAPMSUP330A	Develop and adjust a production schedule	
MSAPMSUP382A	Provide coaching/mentoring in the workplace	
MSAPMSUP383A	Facilitate a team	
MSAPMSUP390A	Use structured problem solving tools	
PMAOHS310B	Investigate incidents	
PMAOHS311B	Lead emergency teams	
PMAOHS312B	Command the operation of survival craft	*
PMAOHS320C	Provide advanced first aid response	*
PMAOHS321B	Provide first aid response in remote and/or isolated area	*
PMAOMIR301B	Undertake initial rescue	*
PMAOMIR302B	Respond to a helideck incident	
PMAOMIR317B	Facilitate search and rescue operations	
PMAOMIR320B	Manage incident response information	
PMAOMIR321B	Manage communication systems during an incident	
PMAOMIR346B	Assess and secure an incident site	

PMASUP305A	Operate Offshore Cranes	
PMASUP311A	Operate communications hub	
PMASUP341B	Monitor and maintain instrument and control systems	*
PMASUP342B	Monitor and maintain electrical systems	*
PMASUP343B	Monitor and maintain cathodic protection systems	
PMASUP344B	Monitor and control repairs and modifications on operational pipe	
PMASUP345A	Monitor vibration	
PMASUP346A	Control corrosion	
PMASUP347A	Undertake corrosion inspection in a petrochemical environment	
MSL973001A	Perform basic tests	
PSPGOV308B	Work effectively with diversity	
TAEASS301B	Contribute to assessment	
TAEDEL301A	Provide work skill instruction	

Up to **one (1)** relevant unit may be chosen from this Training Package, other endorsed Training Packages and accredited courses where the unit is available at Certificates III or IV.

Group C

Unit code	Unit title	Prerequisites
FDFPH1001A	Follow work procedures to maintain Good Manufacturing Practice	
FDFPH2001A	Apply Good Manufacturing Practice procedures	

MEM05012C	Perform routine manual metal arc welding	
MEM09002B	Interpret technical drawing	
MEM11011B	Undertake manual handling	
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	
MEM04001B	Operate melting furnaces	
MSS402002A	Sustain process improvements	
MSS402030A	Apply cost factors to work practices	
MSS402031A	Interpret product costs in terms of customer requirements	
MSS402040A	Apply 5S procedures	
MSS402050A	Monitor process capability	
MSS402051A	Apply quality standards	
MSS402060A	Use planning software systems in operations	
MSS402080A	Undertake root cause analysis	
MSS402081A	Contribute to the application of a proactive maintenance strategy	
MSAPMOHS100A	Follow OHS procedures	
MSAPMOHS205A	Control minor incidents	
MSAPMOHS210B	Undertake first response to non-fire incidents	
MSAPMOHS212A	Undertake first response to fire incidents	
MSAPMOHS216A	Operate breathing apparatus	
MSAPMOHS217A	Gas test atmospheres	
MSAPMOHS220A	Provide initial first aid response	
MSAPMOPS100A	Use equipment	
MSAPMOPS102A	Perform tasks to support production	

MSAPMOPS200A	Operate equipment	
MSAPMOPS212A	Use enterprise computers or data systems	
MSAPMPER200C	Work in accordance with an issued permit	
MSAPMPER201A	Monitor and control work permits	
MSAPMPER202A	Observe permit work	*
MSAPMPER205C	Enter confined space	*
MSAPMSUP101A	Clean workplace or equipment	
MSAPMSUP106A	Work in a team	
MSAPMSUP172A	Identify and minimise environmental hazards	
MSAPMSUP200A	Achieve work outcomes	
MSAPMSUP201A	Receive or despatch goods	
MSAPMSUP204A	Pack products or materials	
MSAPMSUP205A	Transfer loads	
MSAPMSUP210A	Process and record information	
MSAPMSUP240A	Undertake minor maintenance	
MSAPMSUP280A	Manage conflict at work	
MSAPMSUP291A	Participate in continuous improvement	
MSAPMSUP292A	Sample and test materials and product	
MSL952001A	Collect routine site samples	
PMAOHS211B	Prepare equipment for emergency response	
PMAOHS213B	Undertake fire control and emergency rescue	
PMAOHS214B	Undertake helicopter safety and escape	
PMAOHS215B	Apply offshore facility abandonment and sea survival procedures	
PMAOHS221B	Maintain first aid supplies and records	

PMAOMIR210B	Control evacuation to muster point	
PMAOPS101C	Read dials and indicators	
PMAOPS105C	Select and prepare materials	
PMAOPS201B	Operate fluid flow equipment	
PMAOPS202B	Operate fluid mixing equipment	
PMAOPS203B	Handle goods	
PMAOPS204B	Use utilities and services	
PMAOPS205B	Operate heat exchangers	
PMAOPS208B	Operate chemical separation equipment	
PMAOPS210B	Operate particulates handling equipment	
PMAOPS211B	Operate manufacturing extruders	
PMAOPS213B	Package product/material	
PMAOPS216B	Operate local control system	
PMAOPS217B	Operate wet milling equipment	
PMAOPS220B	Monitor chemical reactions in the process	
PMAOPS221B	Operate and monitor prime movers	
PMAOPS222B	Operate and monitor pumping systems and equipment	*
PMAOPS223B	Operate and monitor valve systems	
PMAOPS224B	Provide fluids for utilities and support	
PMAOPS230B	Monitor, operate and maintain pipeline stations and equipment	
PMAOPS231B	Control gas odourisation	
PMAOPS232B	Produce product by filtration	
PMAOPS233A	Monitor wells and gathering systems	
PMAOPS234A	Monitor and operate low pressure	

	compressors	
PMAOPS240B	Store liquids in bulk	
PMAOPS241A	Operate Joule-Thomson effect device	
PMAOPS242A	Moor ships for transfer of bulk processed particulates or fluids	
PMAOPS246A	Operate separation equipment	
PMAOPS247A	Operate powered separation equipment	
PMAOPS260A	Conduct screening operations	
PMAOPS261A	Operate bulk solids loading equipment	
PMAOPS262A	Operate digestion equipment	
PMAOPS263A	Operate leaching equipment	
PMAOPS264A	Operate solvent extraction equipment	
PMAOPS265A	Operate magnetic/electrical separation equipment	
PMAOPS280B	Interpret process plant schematics	
PMAOPS290B	Operate a biotreater	
PMASMELT260B	Form carbon anodes	
PMASMELT261B	Bake carbon anodes	
PMASMELT262B	Clean and strip anode rods	
PMASMELT263B	Spray carbon anodes	
PMASMELT264B	Start up reduction cells	
PMASMELT265B	Operate reduction cells	
PMASMELT266B	Deliver molten metal	
PMASMELT267B	Cast aluminium ingots	
PMASMELT268B	Vertical direct casting	
PMASMELT269A	Operate cell tending equipment	

PMASMELT270A	Supply product from reduction cells	
PMASUP236B	Operate vehicles in the field	
PMASUP237B	Undertake crane, dogging and load transfer operations	
PMASUP241B	Maintain pipeline easements	
PMASUP242B	Monitor pipeline civil works	
PMASUP243B	Monitor and maintain pipeline coatings	
PMASUP244A	Prepare and isolate plant	
PMC552002C	Operate equipment to blend/mix materials	
PMC552003C	Operate grinding equipment	
PMC552008B	Operate crushing equipment	
PMC562070B	Move materials	
RIIOHS204A	Work safely at heights	
RIIRIS201B	Conduct local risk control	
TLID2010A	Operate a forklift	
UEPOPS319B	Operate and monitor gas production plant	

Up to **three (3)** relevant units may be chosen from this Training Package, other endorsed Training Packages and accredited courses where those units are available at Certificates II or III.

Custom Content Section

Not applicable.

PMA40113 Certificate IV in Process Plant Technology

Modification History

Release 2 - ISC upgrade - Addition of industry sector and occupation data to taxonomy fields.

Description

The PMA40113 Certificate IV in Process Plant Technology has been developed as a technical qualification for use in the PMA08 Chemical, Hydrocarbons and Refining Training Package.

Job roles/employment outcomes

The PMA40113 Certificate IV in Process Plant Technology is intended for plant technicians.

The technician will typically be involved in solving complex problems which require theoretical knowledge, combined with an understanding of the production process and equipment across the plant.

Application

This qualification is typically used to develop employees performing a technical role that includes an ability to work independently and conduct technical problem solving according to the needs of the work in the manufactured mineral products industries.

Non-technical team leaders, coordinators and supervisors may be better served by a qualification in competitive manufacturing. The MSA41108 Certificate IV in Competitive Manufacturing is available for team leaders at this level where the job requires sophisticated manufacturing practice skills rather than technical skills.

People with this qualification may be expected to work in one of the following sectors:

- fine chemicals
- heavy chemicals
- petrochemicals
- polymer manufacture
- hydrocarbon extraction
- hydrocarbon transmission
- hydrocarbon processing/refining
- minerals processing/refining
- metalliferous processing/refining
- metals smelting/processing
- other related areas.

Training programs for this qualification are suitable to be undertaken as part of a formal training contract with an employer under an Australian Traineeship or Apprenticeship arrangement.

Pathways Information

Pathways into the qualification

This qualification may be accessed by direct entry. Credit may be granted towards this qualification by those who have completed PMA30113 Certificate III in Process Plant Operations, MSA30107 Certificate III in Process Manufacturing, MSA30208 Certificate III in Manufacturing Technology or other relevant qualifications. Credit for this qualification may also include units contained within relevant skill sets.

Pathways from the qualification

Further training pathways from this qualification include PMA50110 Diploma of Process Plant Technology, MSA51108 Diploma of Competitive Manufacturing, MSA50108 Diploma of Manufacturing Technology or other relevant qualifications, including appropriate vocational graduate qualifications.

Additional qualification advice

MSA41108 Certificate IV in Competitive Manufacturing is available for team leaders at this level who already possess technical skills and who require additional manufacturing practice skills above those available in this qualification.

Licensing/Regulatory Information

There are no specific licences that relate to this qualification. However, in some jurisdictions some units of competency in this qualification may have licensing or regulatory requirements. Local regulations should be checked for details.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification include:

Communication	• maintain communication about multiple subjects and with multiple audiences • complete incident and other reports • communicate technical information • update workplace documentation • maintain workplace records
Teamwork	• identify and describe own role and role of other • assist others identify role • lead team teams either formally or on an ad hoc basis • resolve conflicts between teams
Problem-solving	• recognise persistent problems or those not definable by direct observation • determine problems needing priority action • investigate and analyse problems and potential solutions • work with technical experts to define problems and develop possible solutions • apply appropriate theory base for problem • follow through items initiated until final resolution has occurred • identify and isolate faults in entire plant • use a range of formal problem solving techniques
Initiative and enterprise	• proactive in fine tuning of entire plant • seeks out areas requiring improvement • anticipate the impact of the process on customers and value chain members
Planning and organising	• prioritise actions to achieve required outcomes for plant • plan work requirements for plant • plan plant maintenance or shutdowns/turnarounds • identify tasks to achieve plant goals • allocate tasks • monitor completion of allocated tasks • develop and adjust schedules
Self-management	• plan own work requirements from plant requirements • operate within appropriate time constraints and work standards • select and use appropriate techniques • identify resource requirements, document and monitor • recognise limitations and seek timely advice
Learning	• maintain and develop own competency • assist others to develop their required competencies • lead improvement procedures/strategies

Technology

- improvements to and fine tuning of entire process
- start up and shut down planning and coordinating a shut down/start up of plant
- solving of problems not directly observable
- monitor product/process quality
- function and operating principles of unit, system or plant area
- maintain workplace records

Packaging Rules

To be awarded the PMA40113 Certificate IV in Process Plant Technology competency must be achieved in **twenty six (26)** units of competency:

- **five (5)** core units of competency
- **twenty one (21)** elective units of competency chosen as specified below.

Note: Where prerequisite units apply, these must be considered in the total number of units chosen.

Core units of competency

Unit code	Unit title
MSAENV272B	Participate in environmentally sustainable work practices
MSAPMOHS110A	Follow emergency response procedures
MSAPMOHS200A	Work safely
MSAPMSUP100A	Apply workplace procedures
MSAPMSUP102A	Communicate in the workplace

Elective units of competency

Select **twenty one (21)** units as specified below:

- A minimum of **one (1)** from Group A
- The remainder may be chosen from Groups A, B and C (with a maximum of **eighteen**

(18) from Group C) to bring the total number of electives to **twenty one (21)**.

Note that up to **five (5)** units can be chosen from other qualifications in this Training Package, other endorsed Training Packages and accredited courses, as specified in Groups B and C.

Group A – Specialist electives

Unit code	Unit title	Prerequisites
MSAPMOPS400A	Optimise process/plant area	*
MSAPMOPS401A	Trial new process product	
PMAOPS402A	Respond to abnormal process situations	*
PMAOPS405A	Operate complex control systems	
PMAOPS410B	Monitor remote production facilities	
PMAOPS411B	Manage plant shutdown and restart	
PMAOPS433A	Manage wells and gathering systems	
PMAOPS434A	Commission wells and gathering systems	
PMAOPS450B	Solve colour problems	
PMAOPS460A	Monitor and operate tailings management facilities	

One (1) unit may be chosen from Group A in PMA50110 Diploma of Process Plant Technology

Group B

Unit code	Unit title	Prerequisites
MSS403011A	Lead a competitive manufacturing team	
MSS403013A	Lead team culture improvement	

MSS403002A	Ensure process improvements are sustained	
MSS403030A	Improve cost factors in work practices	
MSS403040A	Facilitate and improve implementation of 5S	
MSS403041A	Facilitate breakthrough improvements	
MSS403051A	Mistake proof an operational process	
MSS404051A	Undertake process capability improvements	*
MSS405052A	Apply statistics to operational processes	
MSS404060A	Facilitate the use of planning software systems in a work area or team	*
MSS404081A	Undertake proactive maintenance analyses	
MSS404082A	Assist in implementing a proactive maintenance strategy	
MSAENV472B	Implement and monitor environmentally sustainable work practices	
MSAPMOHS400A	Contribute to workplace OHS management system	*
MSAPMOHS401A	Assess risk	
MSAPMOPS404A	Co-ordinate maintenance	
MSAPMOPS405A	Identify problems in fluid power system	
MSAPMOPS406A	Identify problems in electronic control systems	
MSAPMPER400A	Coordinate permit process	*
MSAPMSUP400A	Develop and monitor quality systems	
MSL954001A	Obtain representative samples in accordance with a sampling plan	
PMAOHS420B	Develop first aid procedures and manage resources	
PMAOMIR305A	Operate panel during an emergency	*

PMAOMIR407B	Audit incident preparedness and established response system	
PMAOMIR418B	Coordinate incident response	
PMAOMIR424B	Develop and maintain community relationships	
PMAOMIR430B	Conduct and assess incident exercises	
PMAOMIR444B	Develop incident containment tactics	
PMAOMIR449B	Monitor legal compliance obligations during incidents	
PMASUP410B	Develop plant documentation	
PMASUP420B	Minimise environmental impact of process	
PMASUP432B	Coordinate pipeline projects	
PMASUP440B	Commission/recommission plant	
PMASUP441C	Decommission plant	
PMASUP444A	Plan plant preparation and isolation	
PMASUP445A	Participate in HAZOP studies	*
TAEASS401B	Plan assessment activities and processes	
TAEASS402B	Assess competence	
TAEASS403B	Participate in assessment validation	

Up to **one (1)** relevant unit may be chosen from this Training Package, other endorsed Training Packages and accredited courses, where that unit is available at Certificate IV or Diploma.

Group C

Unit code	Unit title	Prerequisites

FDFPH1001A	Follow work procedures to maintain Good Manufacturing Practice	
FDFPH2001A	Apply Good Manufacturing Practice procedures	
FDFPHGMP3A	Monitor the implementation of Good Manufacturing Practice procedures	
MEM05012C	Perform routine manual metal arc welding	
MEM07033B	Operate and monitor basic boiler	
MEM07034A	Operate and monitor intermediate class boiler	*
MEM09002B	Interpret technical drawing	
MEM09003B	Prepare basic engineering drawing	*
MEM11011B	Undertake manual handling	
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities	
MEM18011C	Shutdown and isolate machines/equipment	
MEM40001B	Operate melting furnaces	
MSS402002A	Sustain process improvements	
MSS402030A	Apply cost factors to work practices	
MSS402031A	Interpret product costs in terms of customer requirements	
MSS402040A	Apply 5S procedures	
MSS402050A	Monitor process capability	
MSS402051A	Apply quality standards	
MSS402060A	Use planning software systems in operations	
MSS402080A	Undertake root cause analysis	
MSS402081A	Contribute to the application of a proactive maintenance strategy	

MSAPMOHS100A	Follow OHS procedures	
MSAPMOHS205A	Control minor incidents	
MSAPMOHS210B	Undertake first response to non-fire incidents	
MSAPMOHS212A	Undertake first response to fire incidents	
MSAPMOHS216A	Operate breathing apparatus	
MSAPMOHS217A	Gas test atmospheres	
MSAPMOHS220A	Provide initial first aid response	
MSAPMOHS300A	Facilitate the implementation of OHS for a work group	
MSAPMOPS100A	Use equipment	
MSAPMOPS102A	Perform tasks to support production	
MSAPMOPS200A	Operate equipment	
MSAPMOPS212A	Use enterprise computers or data systems	
MSAPMPER200C	Work in accordance with an issued permit	
MSAPMPER201A	Monitor and control work permits	
MSAPMPER202A	Observe permit work	
MSAPMPER205C	Enter confined space	
MSAPMPER300C	Issue work permits	*
MSAPMSUP101A	Clean workplace or equipment	
MSAPMSUP106A	Work in a team	
MSAPMSUP172A	Identify and minimise environmental hazards	
MSAPMSUP200A	Achieve work outcomes	
MSAPMSUP201A	Receive or despatch goods	
MSAPMSUP204A	Pack products or materials	
MSAPMSUP205A	Transfer loads	

MSAPMSUP210A	Process and record information	
MSAPMSUP240A	Undertake minor maintenance	
MSAPMSUP280A	Manage conflict at work	
MSAPMSUP291A	Participate in continuous improvement	
MSAPMSUP292A	Sample and test materials and product	
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	*
MSAPMSUP301A	Apply HACCP to the workplace	
MSAPMSUP303A	Identify equipment faults	
MSAPMSUP309A	Maintain and organise workplace records	
MSAPMSUP310A	Contribute to development of plant documentation	
MSAPMSUP330A	Develop and adjust a production schedule	
MSAPMSUP382A	Provide coaching/mentoring in the workplace	
MSAPMSUP383A	Facilitate a team	
MSAPMSUP390A	Use structured problem solving tools	
MSL952001A	Collect routine site samples	
MSL973001A	Perform basic tests	
NWP357B	Monitor, operate and control reverse osmosis and nano-filtration processes	
PMAOHS211B	Prepare equipment for emergency response	
PMAOHS213B	Undertake fire control and emergency rescue	
PMAOHS214B	Undertake helicopter safety and escape	
PMAOHS215B	Apply offshore facility abandonment and sea survival procedures	
PMAOHS221B	Maintain first aid supplies and records	
PMAOHS310B	Investigate incidents	

PMAOHS311B	Lead emergency teams	
PMAOHS312B	Command the operation of survival craft	
PMAOHS320C	Provide advanced first aid response	
PMAOHS321B	Provide first aid response in remote and/or isolated area	
PMAOMIR210B	Control evacuation to muster point	
PMAOMIR301B	Undertake initial rescue	
PMAOMIR302B	Respond to a helideck incident	
PMAOMIR317B	Facilitate search and rescue operations	
PMAOMIR320B	Manage incident response information	
PMAOMIR321B	Manage communication systems during an incident	
PMAOMIR346B	Assess and secure an incident site	
PMAOPS101C	Read dials and indicators	
PMAOPS105C	Select and prepare materials	
PMAOPS201B	Operate fluid flow equipment	
PMAOPS202B	Operate fluid mixing equipment	
PMAOPS203B	Handle goods	
PMAOPS204B	Use utilities and services	
PMAOPS205B	Operate heat exchangers	
PMAOPS208B	Operate chemical separation equipment	
PMAOPS210B	Operate particulates handling equipment	
PMAOPS211B	Operate manufacturing extruders	
PMAOPS213B	Package product/material	
PMAOPS216B	Operate local control system	
PMAOPS217B	Operate wet milling equipment	

PMAOPS220B	Monitor chemical reactions in the process	
PMAOPS221B	Operate and monitor prime movers	
PMAOPS222B	Operate and monitor pumping systems and equipment	*
PMAOPS223B	Operate and monitor valve systems	
PMAOPS224B	Provide fluids for utilities and support	
PMAOPS230B	Monitor, operate and maintain pipeline stations and equipment	
PMAOPS231B	Control gas odourisation	
PMAOPS232B	Produce product by filtration	
PMAOPS233A	Monitor wells and gathering systems	
PMAOPS234A	Monitor and operate low pressure compressors	
PMAOPS240B	Store liquids in bulk	
PMAOPS241A	Operate Joule-Thomson effect device	
PMAOPS242A	Moor ships for transfer of bulk processed particulates or fluids	
PMAOPS246A	Operate separation equipment	
PMAOPS247A	Operate powered separation equipment	
PMAOPS260A	Conduct screening operations	
PMAOPS261A	Operate bulk solids loading equipment	
PMAOPS262A	Operate digestion equipment	
PMAOPS263A	Operate leaching equipment	
PMAOPS264A	Operate solvent extraction equipment	
PMAOPS265A	Operate magnetic/electrical separation equipment	
PMAOPS280B	Interpret process plant schematics	

PMAOPS290B	Operate a biotreater	
PMAOPS300B	Operate a production unit	
PMAOPS301B	Produce products by distillation	*
PMAOPS302B	Operate reactors and reaction equipment	
PMAOPS303B	Operate furnaces to induce reaction	
PMAOPS304B	Operate and monitor compressor systems and equipment	*
PMAOPS305B	Operate process control systems	
PMAOPS307B	Transfer bulk fluids into/out of storage facility	*
PMAOPS308B	Organise storage and logistics of general materials	
PMAOPS309B	Operate particulates handling/ storage equipment	
PMAOPS312B	Undertake ship loading/unloading operations	
PMAOPS319A	Adjust batch	
PMAOPS320B	Conduct artificial lift	
PMAOPS321B	Undertake well management	
PMAOPS323A	Operate and monitor heating furnace	
PMAOPS324A	Operate a gas turbine	
PMAOPS325B	Generate electrical power	
PMAOPS326B	Produce product using gas absorption	
PMAOPS327B	Produce product using fixed bed dehydration	
PMAOPS329B	Produce product using liquid extraction	
PMAOPS330B	Communicate pipeline control centre operations	
PMAOPS333A	Operate wells and gathering systems	
PMAOPS335A	Conduct pipeline pigging	

PMAOPS340B	Operate cryogenic processes	
PMAOPS350B	Match and adjust colour	
PMAOPS360A	Operate a metalliferous kiln/furnace	
PMAOPS361A	Operate a smelting furnace	
PMAOPS362A	Operate a blast furnace	
PMAOPS364A	Operate an electrochemical process	
PMAOPS365A	Operate pelletising equipment	
PMAOPS366A	Operate sintering equipment	
PMAOPS390B	Operate a biochemical process	
PMASMELT260B	Form carbon anodes	
PMASMELT261B	Bake carbon anodes	
PMASMELT262B	Clean and strip anode rods	
PMASMELT263B	Spray carbon anodes	
PMASMELT264B	Start up reduction cells	
PMASMELT265B	Operate reduction cells	
PMASMELT266B	Deliver molten metal	
PMASMELT267B	Cast aluminium ingots	
PMASMELT268B	Vertical direct casting	
PMASMELT269A	Operate cell tending equipment	
PMASMELT270A	Supply product from reduction cells	
PMASUP236B	Operate vehicles in the field	
PMASUP237B	Undertake crane, dogging and load transfer operations	
PMASUP241B	Maintain pipeline easements	
PMASUP242B	Monitor pipeline civil works	

PMASUP243B	Monitor and maintain pipeline coatings	
PMASUP244A	Prepare and isolate plant	
PMASUP305A	Operate offshore cranes	
PMASUP311A	Operate communications hub	
PMASUP341B	Monitor and maintain instrument and control systems	*
PMASUP342B	Monitor and maintain electrical systems	*
PMASUP343B	Monitor and maintain cathodic protection systems	
PMASUP344B	Monitor and control repairs and modifications on operational pipe	
PMASUP345A	Monitor vibration	
PMASUP346A	Control corrosion	
PMASUP347A	Undertake corrosion inspection in a petrochemical environment	
PMC552002C	Operate equipment to blend/mix materials	
PMC552003C	Operate grinding equipment	
PMC552008B	Operate crushing equipment	
PMC562070B	Move materials	
PSPGOV308B	Work effectively with diversity	
RIIOHS204A	Work safely at heights	
RIIRIS201B	Conduct local risk control	
TAEASS301B	Contribute to assessment	
TAEDEL301A	Provide work skill instruction	
TLID2010A	Operate a forklift	
UEPOPS319B	Operate and monitor gas production plant	
UEPOPS340B	Operate and monitor a steam turbine	

Up to **four (4)** relevant units may be chosen from this Training Package, other endorsed Training Packages and accredited courses where those units are available at Certificates III and IV.

Custom Content Section

Not applicable.

PMA50108 Diploma of Process Plant Technology

Modification History

Release 2 - addition of one new elective in Group A

Description

The Diploma of Process Plant Technology has been developed as a technical qualification for use in the Chemical, Hydrocarbons and Refining Training Package (PMA08). This qualification covers the skills and knowledge required to perform advanced technical and para-professional operations within the chemical, hydrocarbon and refining industries

Job roles/employment outcomes

The Diploma of Process Plant Technology is intended for technologists or para-professionals who may have worked their way up through the chemical, hydrocarbons or refining certificate qualifications or who have entered the industry at this level, either from another industry or trade occupation.

The technologist will analyse performance and failure in equipment and products and will assist in the development on new and modified products.

The Diploma of Competitive Manufacturing MCM50104 is available for team leaders and managers at this level where the job requires sophisticated manufacturing practice skills rather than technical skills.

Application

This qualification is typically used to develop employees performing a highly technical role that includes an ability to lead others and conduct technical problem solving according to the needs of the work in the chemical, hydrocarbons or refining industries.

People with this qualification may be expected to work in one of the following sectors:

- fine chemicals
- heavy chemicals
- petrochemicals
- polymer manufacture
- hydrocarbon extraction
- hydrocarbon transmission

- hydrocarbon processing/refining
- minerals processing/refining
- metals smelting/processing
- other related areas.

Training programs for this qualification are suitable to be undertaken as part of a formal training contract with an employer under an Australian Traineeship or Apprenticeship arrangement.

Pathways into the qualification

This qualification may be accessed by direct entry. The Diploma of Process Plant Technology also offers advanced technical training to people who have completed PMA40110 Certificate IV in Process Plant Technology or other relevant qualifications, or who have significant relevant industry experience without formal qualifications. Credit for this qualification may include units contained within relevant skill sets.

Pathways from the qualification

Further training pathways from this qualification include PMA60110 Advanced Diploma of Process Plant Technology, MSA60108 Advanced Diploma of Manufacturing Technology, MSA61108 Advanced Diploma of Competitive Manufacturing or other relevant qualifications, including appropriate vocational graduate qualifications.

Additional qualification advice

MSA51108 Diploma of Competitive Manufacturing is available for team leaders and managers at this level who already possess technical skills and who require additional manufacturing practice skills above those available in this qualification.

Licensing considerations

There are no specific licences that relate to this qualification. However, in some jurisdictions some units of competency in this qualification may have licensing or regulatory requirements. Local regulations should be checked for details.

Pathways Information

Not applicable.

Licensing/Regulatory Information

Not applicable.

Entry Requirements

Not applicable.

Employability Skills Summary

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY	
Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• communicate with stakeholders • complete all required reports and records • advise stakeholders of the outcome • interpret workplace procedures and work instructions • communicate information about tasks/processes/events • identify and communicate with all relevant personnel • communicate with all relevant personnel, management and administration • undertake interactive workplace communication • undertake verbal and/or written reports where required
Teamwork	• working with technicians as part of a larger project • work autonomously or as part of a team • identify own role and responsibility within a team • undertake appropriate and effective communication with team members
Problem-solving	• evaluate and modify as required • apply knowledge of materials, product purpose and processes • check performance of equipment and make approved adjustments • make adjustments to remedy faults and non-conformity • clarifying and addressing potential issues • use material and process knowledge to solve problems
Initiative and enterprise	• make adjustments to improve equipment/plant performance • anticipate the impact of the process on the product • determine problems needing action • recommend required action • recognise problems in systems and documentation • critically analyse information • develop continuous improvement strategies • investigate, rectify and report non-conformance • use analytical and decision making skills

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY

	• recommend corrective and/or optimization actions • monitor and adjust schedules in response to operational variations
Planning and organising	• implement within appropriate time constraints and relevant to the job • organise trials • develop and monitor quality systems • monitor and maintain product quality • recognise hazards and follow appropriate hazard control methods • identify requirements for materials, quality, production and equipment checks • identify most efficient and appropriate equipment • analyse equipment performance
Self-management	• operate within appropriate time constraints and work standards • select and use appropriate equipment, materials, processes and procedures • identify resource requirements, document and monitor • consistent performance should be demonstrated
Learning	• research and evaluate equipment and plant • ask questions to gain information • identify sources of information to expand knowledge and understanding • recognise limits of own professional expertise and consult specialists as necessary • participate in improvement procedures • access manufacturer's manuals/specifications to expand knowledge
Technology	• differentiate between products and materials based on their properties and uses • analyse response to changes in process conditions • apply the results of the analyses to typical applications • analyse equipment performance • determine theoretical performance • determine variation between theoretical and actual performance. • application principles to the design and use of equipment.

Packaging Rules

To be awarded the Diploma of Process Plant Technology competency must be achieved in **ten (10)** units of competency:

- **four (4)** core units of competency
- **six (6)** elective units of competency from Groups A and B, chosen as specified below.

Note

Where prerequisite units apply, these must be considered in the total number of units chosen.

Core units of competency

Unit code	Unit title
MSAENV272B	Participate in environmentally sustainable work practices
MSAPMOHS200A	Work safely
MSAPMSUP200A	Achieve work outcomes
MSAPMSUP210A	Process and record information

Elective units of competency

Select **six (6)** units from Groups A, B and C, as specified below:

- A minimum of **two (2)** from Group A
- The remainder may be chosen from Groups A, B and C (with a maximum of **two (2)** from Group C) to bring the total number of electives to **six (6)**.

Note that **two (2)** elective units can be chosen from other qualifications in this Training Package, other endorsed Training Packages and accredited courses as specified in Group C.

Group A - Specialist electives

Unit code	Unit title	Prerequisites
PMAOPS500A	Optimise production systems	
PMAOPS501A	Provide operational expertise to a project team	
PMAOPS505A	Control the process in abnormal situations	
PMAOPS511B	Determine energy transfer loads	
PMAOPS512B	Determine mass transfer loads	
PMAOPS520C	Manage utilities	
PMAOPS521C	Plan plant shutdown	
PMAOPS522A	Coordinate plant shut down	
PMAOPS550B	Develop a colour formulation	PMAOPS350B PMAOPS450B
PMAOPS560A	Plan and design tailings management facilities	

Up to **one (1)** specialist elective unit may be chosen from Group A in PMA60108 Advanced Diploma of Process Plant Technology

Group B

Unit code	Unit title	Prerequisites
MSAPMOHS503A	Maintain the workplace OHS management system	
MSAPMOHS510A	Manage risk	MSAPMOHS401A
MSAPMOHS601A	Establish workplace OHS management system	MSAPMOHS503A
PMAOHS502B	Contribute to safety case	
PMAOHS511A	Manage emergency incidents	PMAOMIR320B

PMAOMIR512B	Establish incident response preparedness and response systems	
PMAOMIR523B	Manage corporate media requirements in a crisis	
PMAOMIR575B	Coordinate welfare support activities in response to an incident	
PMASUP520B	Review procedures to minimise environmental impact of process	
PMASUP540B	Analyse equipment performance	

Group C

Unit code	Unit title	Prerequisites
MSS403011A	Facilitate implementation of competitive systems and practices	
MSS403013A	Lead team culture improvement	
MSS403002A	Ensure process improvements are sustained	
MSS403030A	Improve cost factors in work practices	
MSS403040A	Facilitate and improve implementation of 5S	
MSS403041A	Facilitate breakthrough improvements	
MSS404050A	Undertake process capability improvements	MSS404052A
MSS403051A	Mistake proof an operational process	
MSS404052A	Apply statistics to operational processes	
MSS404060A	Facilitate the use of planning software systems in a work area or team	
MSS404081A	Undertake proactive maintenance analyses	
MSS404082A	Assist in implementing a proactive maintenance strategy	

MSAENV472B	Implement and monitor environmentally sustainable work practices	
MSAPMOHS400A	Contribute to workplace OHS management system	MSAPMOHS300A
MSAPMOHS401A	Assess risk	
MSAPMOPS400A	Optimise process/plant area	MSAPMSUP390A
MSAPMOPS401A	Trial new process product	
MSAPMOPS404A	Co-ordinate maintenance	
MSAPMOPS405A	Identify problems in fluid power system	
MSAPMOPS406A	Identify problems in electronic control systems	
MSAPMPER400A	Coordinate permit process	
MSAPMSUP400A	Develop and monitor quality systems	
MSL954001A	Obtain representative samples in accordance with a sampling plan	
PMAOHS420B	Develop first aid procedures and manage resources	
PMAOMIR320B	Manage incident response information	
PMAOMIR407B	Audit incident preparedness and established response system	
PMAOMIR418B	Coordinate incident response	
PMAOMIR424B	Develop and maintain community relationships	
PMAOMIR430B	Conduct and assess incident exercises	
PMAOMIR444B	Develop incident containment tactics	
PMAOMIR449B	Monitor legal compliance obligations during incidents	
PMAOPS350B	Match and adjust colour	
PMAOPS402A	Respond to abnormal process situations	MSAPMSUP390A

PMAOPS405A	Operate complex control systems	
PMAOPS410B	Monitor remote production facilities	
PMAOPS411B	Manage plant shutdown and restart	
PMAOPS450B	Solve colour problems	
PMASUP410B	Develop plant documentation	
PMASUP420B	Minimise environmental impact of process	
PMASUP432B	Coordinate pipeline projects	
PMASUP440B	Commission/recommission plant	
PMASUP441C	Decommission plant	
PMASUP445A	Participate in HAZOP studies	
TAEASS401B	Plan assessment activities and processes	
TAEASS402B	Assess competence	
TAEASS403B	Participate in assessment validation	

Up to **two (2)** relevant units may be chosen from this Training Package, other endorsed Training Packages and accredited courses where those units are available at Certificate IV or above.

PMA60108 Advanced Diploma of Process Plant Technology

Modification History

Release 2 - imported units updated to current versions

Description

The Advanced Diploma of Process Plant Technology has been developed as a technical qualification for use in the Chemical, Hydrocarbons and Refining Training Package (PMA08). This qualification covers the skills and knowledge required to perform advanced technical and para-professional operations within the chemical, hydrocarbons or refining industries

Job roles/employment outcomes

The Advanced Diploma of Process Plant Technology is intended for process plant technologists or para-professionals who may have worked their way up through the chemical, hydrocarbons or refining certificate qualifications or who have entered the industry at this level, either from another industry or trade occupation.

The process plant technologist will analyse performance and failure in equipment and products and will assist in the development on new and modified products.

The Advanced Diploma of in Competitive Manufacturing MCM60104 is available for team leaders and managers at this level where the job requires sophisticated manufacturing practice skills rather than technical skills.

Application

This qualification is typically used to develop employees performing a highly technical role that includes an ability to lead others and conduct technical problem solving according to the needs of the work in the manufactured mineral products industries.

People with this qualification may be expected to work in one of the following sectors:

- fine chemicals
- heavy chemicals
- petrochemicals
- polymer manufacture
- hydrocarbon extraction

- hydrocarbon transmission
- hydrocarbon processing/refining
- minerals processing/refining
- metals smelting/processing
- other related areas.

Training programs for this qualification are suitable to be undertaken as part of a formal training contract with an employer under an Australian Traineeship or Apprenticeship arrangement.

Pathways into the qualification

The Advanced Diploma of Process Plant Technology offers advanced technical training to people who have completed PMA50110 Diploma of Process Plant Technology or other relevant qualifications, or who have significant relevant industry experience without formal qualifications. Credit for this qualification may include units contained within relevant skill sets.

Pathways from the qualification

Further training pathways from this qualification include PMA70108 Graduate Certificate in Surface Coatings, MSA60108 Advanced Diploma of Manufacturing Technology, MSA61108 Advanced Diploma of Competitive Manufacturing or other relevant qualifications, including appropriate vocational graduate qualifications.

Additional qualification advice

MSA61108 Advanced Diploma of Competitive Manufacturing is available for team leaders and managers at this level who already possess technical skills and who require additional manufacturing practice skills above those available in this qualification.

Licensing considerations

There are no specific licences that relate to this qualification. However, in some jurisdictions some units of competency in this qualification may have licensing or regulatory requirements. Local regulations should be checked for details.

Pathways Information

Not applicable.

Licensing/Regulatory Information

Not applicable.

Entry Requirements

Not applicable.

Employability Skills Summary

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY	
Employability Skill	Industry/enterprise requirements for this qualification include:
Communication	• verify with appropriate people. • determine modification requirements • liaise with personnel • complete all reports. • communicate with stakeholders • obtain 'sign off' from all relevant persons. • communicate with production personnel • ensure project records are complete
Teamwork	• work autonomously or as part of a team • liaise and cooperate with other team members • identify own role and responsibility within a team • undertake appropriate and effective communication with team members
Problem-solving	• optimise production of new product/use of new or modified process • apply knowledge of materials, product purpose and processes • check performance of equipment/plant and make approved adjustments • make adjustments to remedy faults and non-conformity • clarifying and addressing potential issues • identify problems and make contributions to their solution
Initiative and enterprise	• make adjustments to improve equipment/plant performance • anticipate the impact of the process on the product • determine problems needing action • recommend required action • recognise problems in systems and documentation • critically analyse information

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY

	• develop continuous improvement strategies • investigate, rectify and report non-conformance • predict consequences and identify improvements • use analytical and decision making skills • recommend corrective and/or optimization actions
Planning and organising	• supervise process/plant trials • ensure process needs for new product have been met. • coordinate trials • plan operation • identify requirements for materials, quality, production and equipment/plant checks • identify most efficient and appropriate equipment/plant • analyse equipment/plant performance
Self-management	• operate within appropriate time constraints and work standards • select and use appropriate equipment, materials, processes and procedures • identify resource requirements, document and monitor • consistent performance should be demonstrated
Learning	• research and evaluate equipment • ask questions to gain information • identify sources of information to expand knowledge and understanding • recognise limits of own professional expertise and consult specialists as necessary • participate in improvement procedures • access manufacturer's manuals/specifications to expand knowledge
Technology	• undertake plant modifications • determine material requirements for product. • determine process requirements for product. • interpret trial results • interpret specifications • monitor initial production and adjust process, conditions and materials • develop a modified process

Packaging Rules

To be awarded the Advanced Diploma of Process Plant Technology competency must be achieved in **fifteen (15)** units of competency:

- **four (4)** core units of competency
- **eleven (11)** elective units of competency, chosen as specified below.

Note

Where prerequisite units apply, these must be considered in the total number of units chosen.

Core units of competency

Unit code	Unit title
MSAENV272B	Participate in environmentally sustainable work practices
MSAPMOHS200A	Work safely
MSAPMSUP200A	Achieve work outcomes
MSAPMSUP210A	Process and record information

Elective units of competency

Select **eleven (11)** units as specified below:

- A minimum of **one (1)** from Group A
- A minimum of **one (1)** from Group B
- The remainder may be chosen from Groups A, B, C and D (with a maximum of **seven (7)** from Group D) to bring the total number of electives to **eleven (11)**.

Note that three (3) elective units can be chosen from other qualifications in this Training Package, other endorsed Training Packages and accredited courses as specified in Groups C and D.

Group A

Unit code	Unit title	Prerequisites
PMAOPS600C	Modify plant	
PMAOPS601A	Debottleneck plant	

Group B

Unit code	Unit title	Prerequisites
MSS405010A	Manage relationships with non-customer external organisations	
MSS405011A	Manage people relationships	
MSS405012A	Manage workplace learning	
MSS405030A	Optimise cost of a product or service	MSS405031A
MSS405040A	Manage 5S system in an organisation	
MSS405041A	Implement improvement systems in an organisation	
MSS405050A	Determine and improve process capability	MSS404052A
MSS405060A	Develop the application of enterprise control systems in an organisation	
MSS405061A	Determine and establish information collection requirements and processes	
MSS405070A	Develop and manage sustainable energy practices	
MSACMT671A	Develop and manage sustainable environmental practices	
MSS405081A	Develop a proactive maintenance strategy	
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	

MSAPMOHS601A	Establish workplace OHS management system	MSAPMOHS503A
MSL936001A	Maintain quality system and continuous improvement processes within work/functional area	
PMAOMIR622B	Build partnerships to improve incident response capacity	
PMAOMIR650B	Manage a crisis	
PMASUP620B	Manage environmental management system	PMASUP520B
PSPMNGT604B	Manage change	
PSPMNGT605B	Manage diversity	

Group C

Unit code	Unit title	Prerequisites
MSAPMOHS503A	Maintain the workplace OHS management system	
MSAPMOHS510A	Manage risk	MSAPMOHS401A
PMAOHS502B	Contribute to safety case	
PMAOHS511A	Manage emergency incidents	PMAOMIR320B
PMAOMIR512B	Establish incident response preparedness and response systems	
PMAOMIR523B	Manage corporate media requirements in a crisis	
PMAOMIR575B	Coordinate welfare support activities in response to an incident	
PMAOPS500A	Optimise production systems	
PMAOPS501A	Provide operational expertise to a project team	

PMAOPS505A	Control the process in abnormal situations	
PMAOPS511B	Determine energy transfer loads	
PMAOPS512B	Determine mass transfer loads	
PMAOPS520C	Manage utilities	
PMAOPS521C	Plan plant shutdown	
PMAOPS522A	Coordinate plant shut down	
PMAOPS550B	Develop a colour formulation	PMAOPS350B PMAOPS450B
PMASUP520B	Review procedures to minimise environmental impact of process	
PMASUP540B	Analyse equipment performance	

Up to **one (1)** relevant unit may be chosen from this Training Package, other endorsed Training Packages and accredited courses where that unit is available for inclusion at Diploma or above.

Group D

Code	Title	Prerequisite/s
MSS403011A	Facilitate implementation of competitive systems and practices	
MSS403013A	Lead team culture improvement	
MSS403002A	Ensure process improvements are sustained	
MSS403030A	Improve cost factors in work practices	
MSS403040A	Facilitate and improve implementation of 5S	
MSS403041A	Facilitate breakthrough improvements	
MSS404050A	Undertake process capability improvements	MSS405052A

MSS403051A	Mistake proof an operational process	
MSS404052A	Apply statistics to operational processes	
MSS404060A	Facilitate the use of planning software systems in a work area or team	
MSS404081A	Undertake proactive maintenance analyses	
MSS404082A	Assist in implementing a proactive maintenance strategy	
MSAENV472B	Implement and monitor environmentally sustainable work practices	
MSAPMOHS400A	Contribute to workplace OHS management system	MSAPMOHS300A
MSAPMOHS401A	Assess risk	
MSAPMOPS400A	Optimise process/plant area	MSAPMSUP390A
MSAPMOPS401A	Trial new process product	
MSAPMOPS404A	Co-ordinate maintenance	
MSAPMOPS405A	Identify problems in fluid power system	
MSAPMOPS406A	Identify problems in electronic control systems	
MSAPMPER400A	Coordinate permit process	
MSAPMSUP400A	Develop and monitor quality systems	
MSL954001A	Obtain representative samples in accordance with a sampling plan	
PMAOHS420B	Develop first aid procedures and manage resources	
PMAOMIR320B	Manage incident response information	
PMAOMIR407B	Audit incident preparedness and established response system	
PMAOMIR418B	Coordinate incident response	
PMAOMIR424B	Develop and maintain community	

	relationships	
PMAOMIR430B	Conduct and assess incident exercises	
PMAOMIR444B	Develop incident containment tactics	
PMAOMIR449B	Monitor legal compliance obligations during incidents	
PMAOPS350B	Match and adjust colour	
PMAOPS402A	Respond to abnormal process situations	MSAPMSUP390A
PMAOPS405A	Operate complex control systems	
PMAOPS410B	Monitor remote production facilities	
PMAOPS411B	Manage plant shutdown and restart	
PMAOPS450B	Solve colour problems	
PMASUP410B	Develop plant documentation	
PMASUP420B	Minimise environmental impact of process	
PMASUP432B	Coordinate pipeline projects	
PMASUP440B	Commission/recommission plant	
PMASUP441C	Decommission plant	
PMASUP445A	Participate in HAZOP studies	PMAOPS280A
TAEASS401B	Plan assessment activities and processes	
TAEASS402B	Assess competence	
TAEASS403B	Participate in assessment validation	

Up to **two (2)** relevant units may be chosen from this Training Package, other endorsed Training Packages and accredited courses where those units are available for inclusion at Certificate IV or above.

PMA70108 Vocational Graduate Certificate in Surface Coating Technology

Modification History

Not applicable.

Description

This qualification was developed in response to an existing industry need which has previously been met by a non-Training Package qualification. It has strong industry support and the qualification and its units of competency reflect the industry demanded requirements.

The Vocational Graduate Certificate in Surface Coating Technology has been developed as a technical qualification for use in the Chemical, Hydrocarbons and Refining Training Package (PMA08). This qualification covers the skills and knowledge required to perform advanced technical and para-professional operations within the surface coating (paint) sector

Job roles/employment outcomes

The Vocational Graduate Certificate in Surface Coating Technology has been developed as a technical qualification for technicians and other technical people who come to the industry with a relevant qualification, or relevant extensive vocational practice without formal qualifications, and need specialist surface coating knowledge.

The process surface coating technologist will analyse performance and failure of surface coatings and surface coating products and will assist in the development on new and modified products.

The Advanced Diploma of in Competitive Manufacturing MCM60104 is available for team leaders and managers at this level where the job requires sophisticated manufacturing practice skills rather than technical skills.

Application

This qualification is typically used to develop employees performing a highly technical role that includes an ability to lead others and conduct technical problem solving according to the needs of the work in the manufactured mineral products industries. It is specifically aimed at those requiring specialist surface coatings knowledge and skills.

People with this qualification may be expected to work in one of the following sectors:

- decorative surface coatings
- non-decorative/industrial surface coatings
- special purpose surface coatings
- other related areas.

Pathways into the qualification

The Vocational Graduate Certificate in Surface Coating Technology offers advanced technical training to people who have completed a suitable technical qualification such as a Bachelor of Science degree or the PMA60110 Advanced Diploma of Process Plant Technology or other relevant qualifications, or who have significant relevant industry experience without formal qualifications. Credit for this qualification may include units contained within relevant skill sets.

Pathways from the qualification

Further training pathways from this qualification include MSA60108 Advanced Diploma of Manufacturing Technology, MSA61108 Advanced Diploma of Competitive Manufacturing or other relevant qualifications, including appropriate vocational graduate qualifications.

Additional qualification advice

MSA61108 Advanced Diploma of Competitive Manufacturing is available for team leaders and managers at this level who already possess technical skills and who require additional manufacturing practice skills above those available in this qualification.

Licensing considerations

There are no specific licences that relate to this qualification. However, in some jurisdictions some units of competency in this qualification may have licensing or regulatory requirements. Local regulations should be checked for details.

Pathways Information

Not applicable.

Licensing/Regulatory Information

Not applicable.

Entry Requirements

Not applicable.

Employability Skills Summary

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY	
Employability Skill	Industry/enterprise requirements for this qualification
Communication	• communicate technically with both technicians and customers. • determine problems/issues

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY

	• explain requirements and problem solutions • complete all reports. • communicate with stakeholders • obtain 'sign off' from all relevant persons. • ensure project records are complete
Teamwork	• work autonomously or as part of a team • liaise and cooperate with other team members • identify own role and responsibility within a team • undertake appropriate and effective communication with team members
Problem-solving	• identify and define problems • apply knowledge of materials, product purpose and processes • suggest solutions to problems • clarifying and addressing potential issues
Initiative and enterprise	• determine problems needing action • recommend required action • recognise problems in systems and documentation • critically analyse information • develop continuous improvement strategies • investigate, rectify and report non-conformance • use analytical and decision making skills • recommend corrective and/or optimization actions
Planning and organising	• organise and prioritise require work • coordinate actions or various people • plan work activities • identify requirements for resources and organise their availability • analyse surface coating systems
Self-management	• operate within appropriate time constraints and work standards • select and use appropriate equipment, materials, processes and procedures • identify resource requirements, document and monitor • consistent performance should be demonstrated
Learning	• research and evaluate surface coating systems • ask questions to gain information • identify sources of information to expand knowledge and understanding • recognise limits of own professional expertise and consult specialists as necessary • participate in improvement procedures

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY

	access technical manuals/specifications to expand knowledge
Technology	- use testing equipment - determine requirements for activities and projects. - interpret test/trial results - interpret procedures and specifications - recommend a modified process

Packaging Rules

Packaging Rules

To be awarded the Vocational Graduate Certificate in Surface Coating Technology competency must be achieved in eleven (11) units of competency:

- Three (3)** core units of competency
- Eight (8)** elective units of competency chosen as specified below.

Core units of competency

Code	Title	Prerequisite/s
MSAPMOHS200A	Work safely	
PMAOPS751A	Apply physiochemical knowledge to select raw materials for surface coatings	
MSL936001A	Maintain quality system and continuous improvement processes within work/functional area	

Elective units of competency

Select **eight (8)** units as specified below:

- A minimum of **one (1)** from Group A

- The remainder may be chosen from Groups A, B and C (with a maximum of **four (4)** from Group C) to bring the total number of electives to **eight (8)**.

Note that **two (2)** units can be chosen from other qualifications in this Training Package, other endorsed Training Packages and accredited courses as specified in Group C.

Group A

Code	Title	Prerequisite/s
PMAOPS752A	Develop a decorative coating	
PMAOPS753A	Develop a non-decorative coating or ink	

Group B

Code	Title	Prerequisite/s
MSL977001A	Contribute to the development of products and applications	MSL976003A
MSL977002A	Troubleshoot equipment and production processes	MSL976003A
MSL977004A	Develop or adapt analyses and procedures	MSL976003A
PMAOPS755A	Provide surface coatings application advice	

Group C

Code	Title	Prerequisite/s
MSL976003A	Evaluate and select appropriate test methods and/or	

Code	Title	Prerequisite/s
	procedures	
PMAOPS350B	Match and adjust colour	
PMAOPS450B	Solve colour problems	
PMAOPS550B	Develop a colour formulation	PMAOPS350B PMAOPS450B
A maximum of two (2) units may be chosen from other qualifications in this Training Package, other endorsed Training Packages and accredited courses, where those units are available for inclusion at Certificate IV or above.		

PMASS00001 Confined space work team

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

Pathway

These units of competency can provide credit towards Certificates II and III in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

MSAPMOHS200A Work safely

MSAPMPER200C Work in accordance with an issued permit

MSAPMPER202A Observe permit work

MSAPMPER205C Enter confined space

Target Group

Target group

Persons entering a confined space must do so in accordance with the relevant Australian Standard. Where members of a work team are expected to undertake multiple roles in regard to the confined space entry, then they must be competent in all those roles. This skills set is targeted at such a work team. This training would occur before starting work requiring entry to a confined space. This may occur either as part of safety training to work on the site or more commonly as separate training after initial safety induction.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet the minimum industry requirements for members of a confined space work team.

PMASS00002 Contractor induction

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

Pathway

These competencies can provide credit towards PMA20108 Certificate II in Process Plant Operations.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

MSAPMOHS200A Work safely

MSAPMPER200C Work in accordance with an issued permit

Target Group

Target group

Much non-operational work (in particular maintenance and shut-downs) is conducted by contractors who are not permitted to work on site until they have been assessed as meeting minimum OHS requirements. This Skills Set reflects those minimum requirements. However, there may be other requirements before a contractor can start work on some sites.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package provide initial training that meets minimum industry requirements before commencing work on site.

PMASS00003 Emergency centre team

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

Pathway

These units of competency can provide credit towards Certificates III and IV and the Diploma in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

PMAOMIR320B Manage incident response information

PMAOMIR317B Facilitate search and rescue operations

PMAOMIR449B Monitor legal compliance obligations during incidents

PMAOMIR523B Manage corporate media requirements in a crisis

PMAOMIR575B Coordinate welfare support activities in response to an incident

In some situations it may be appropriate to add:

PMAOMIR424B Develop community awareness networks.

Target Group

Target group

Significant incidents will require a support team operating from the emergency centre to assist with the management of an incident. These may be operational or support staff who require specific competencies to undertake this work.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet basic industry requirements for emergency centre members.

PMASS00004 Hot work observer

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

Pathway

These units of competency can provide credit towards Certificates II and III in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

MSAPMOHS200A Work safely

MSAPMPER200C Work in accordance with an issued permit

MSAPMPER202A Observe permit work

MSAPMOHS212A Undertake first response to fire incidents

Target Group

Target group

Persons undertaking 'hot work' frequently require a 'hot work observer' (or 'fire watch'). This training would occur before starting work of this nature. Training may occur either as part of safety training to work on the site or more commonly as separate training after initial safety induction.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet the minimum industry requirements for a 'hot work observer'.

PMASS00005 Incident response commander

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

Pathway

These units of competency can provide credit towards Certificates III and IV in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

PMAOHS310B Investigate incidents

PMAOMIR418B Coordinate incident response

PMAOMIR444B Develop incident containment tactics

PMAOMIR320B Manage incident response information

PMAOHS511A Manage emergency incidents

Target Group

Target group

An incident commander takes charge of the organisation's response to an incident and may have several incident response teams under their direction. This role requires specific non-operational competencies.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet basic industry requirements for incident response commanders.

PMASS00006 Incident response team leader

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

Pathway

These units of competency can provide credit towards Certificates III and IV in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

PMAOHS311B Lead emergency teams

PMAOMIR317B Facilitate search and rescue operations

PMAOMIR320B Manage incident response information

PMAOMIR346B Assess and secure an incident site

Target Group

Target group

Incident response teams require a team leader. Typically, these are senior operational personnel with additional competencies covering incident response.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet the minimum industry requirements for an Incident Response Team Leader.

PMASS00007 Incident response team member

Modification History

Release 3 - inclusion of prerequisite units in Skill Set Requirements

Description

Not applicable.

Pathways Information

Pathway

These units of competency can provide credit towards Certificates II and III in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

MSAPMOHS205A	Control minor incidents
MSAPMOHS210B	Undertake first response to non-fire incidents
MSAPMOHS212A	Undertake first response to fire incidents
MSAPMOHS216A	Operate breathing apparatus
MSAPMOHS217A	Gas test atmospheres
MSAPMOHS220A	Provide initial First Aid response
MSAPMPER200C	Work in accordance with an issued permit
MSAPMPER205C	Enter confined space
PMAOHS213B	Undertake fire control and emergency rescue
PMAOMIR301B	Undertake initial rescue

Target Group

Target group

Organisations in this industry often require employees to undertake non-operational work as members of an internal incident response team. Specific incident response competencies are needed to meet these requirements.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet the minimum industry requirements for initial incident response.

PMASS00008 Offshore crane driver

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

Pathway

These units of competency can provide credit towards Certificates II and III in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

PMASUP305A Operate offshore cranes

PMASUP237B Undertake crane, dogging and load transfer operations

MSAPMSUP205A Transfer loads

Target Group

Target group

Personnel working in an offshore environment require specific competencies before they can independently operate a crane.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet the basic industry requirements for an offshore crane driver.

PMASS00009 Offshore incident response team member

Modification History

Release 2 - inclusion of prerequisite units in Skill Set Requirements

Description

Not applicable.

Pathways Information

Pathway

These units of competency can provide credit towards Certificates II and III in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

MSAPMOHS205A	Control minor incidents
MSAPMOHS210B	Undertake first response to non-fire incidents
MSAPMOHS212A	Undertake first response to fire incidents
MSAPMOHS216A	Operate breathing apparatus
MSAPMOHS217A	Gas test atmospheres
MSAPMOHS220A	Provide initial First Aid response
MSAPMPER200C	Work in accordance with an issued permit
MSAPMPER205C	Enter confined space
PMAOHS213B	Undertake fire control and emergency rescue
PMAOMIR301B	Undertake initial rescue

PMAOMIR302B Respond to a helideck incident

Target Group

Target group

Offshore operations require an incident response team to have additional capabilities to an onshore environment. Team members are typically operational personnel with specific incident response competencies.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet the minimum industry requirements for initial incident response in an offshore environment.

PMASS00010 Offshore operator safety induction

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

Pathway

These units of competency can provide credit towards Certificates II and III in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

MSAPMOHS110A Follow emergency response procedures

MSAPMOHS200A Work safely

MSAPMOHS205A Control minor incidents

PMAOHS214A Undertake helicopter safety and escape

PMAOHS215A Apply offshore facility abandonment and sea survival procedures

Target Group

Target group

Persons working in an offshore environment (such as oil/gas platforms, FSO/FPSO) require additional induction to those working in an onshore environment (in particular HUET and related competencies). This would be initial training before being deployed to an offshore site.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet the minimum industry requirements for initial offshore induction.

PMASS00011 Pipeline transmission

Modification History

Not applicable.

Description

Not applicable.

Pathways Information

Pathway

These units of competency can provide credit towards Certificates II and III in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

PMAOPS221B Operate and monitor prime movers

PMAOPS222B Operate and monitor pumping systems and equipment

PMAOPS223B Operate and monitor valve systems

PMAOPS230B Monitor, operate and maintain pipeline stations and equipment

Target Group

Target group

In the hydrocarbons industry, personnel operating pipelines that move hydrocarbons vast distances require a specific set of operational skills that must be achieved before independently operating a pipeline.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet basic industry requirements for a transmission pipeline operator.

PMASS00012 Workplace assessor

Modification History

Release 2 - imported units updated to current versions

Description

Not applicable.

Pathways Information

Pathway

These imported units of competency can provide credit towards Certificates III and IV in PMA08 Chemical, Hydrocarbons&Refining Training Package.

Licensing/Regulatory Information

Not applicable.

Skill Set Requirements

Units

TAEASS401B Plan assessment activities and processes

TAEASS402B Assess competence

TAEASS403B Participate in assessment validation

Target Group

Target group

Many senior operators in the chemical, hydrocarbons and refining industries are required as part of their role to undertake or assist with workplace assessment of PMA08 competencies.

Suggested words for Statement of Attainment

Suggested words for Statement of Attainment

These competencies from PMA08 Chemical, Hydrocarbons&Refining Training Package meet the basic AQTF requirements for a qualified assessor.

PMAOHS211B Prepare equipment for emergency response

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency unit covers the preparation and minor servicing of equipment used to respond to emergency situations.

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify emergency equipment.	1.1. Locate emergency equipment 1.2. Ensure access is provided to emergency equipment.
2. Inspect and assemble emergency equipment.	2.1. Inspect emergency equipment for faults or damage 2.2. Secure couplings/connections and operational condition 2.3. Assemble equipment in accordance with manufacturer specifications 2.4. Identify and report any missing or damaged components.
3. Carry out minor servicing of equipment.	3.1. Maintain and clean equipment according to specifications/procedures 3.2. Conduct servicing in accordance with specifications/procedures 3.3. Ensure equipment is 'made-ready' and stored in designated location 3.4. Ensure equipment functions in accordance with specifications.
4. Report and record equipment status.	4.1. Record and report equipment status 4.2. Raise maintenance requests as required 4.3. Undertake corrective actions as required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
- hand skills - follow procedures - observation - completing records - assembling and operating various pieces of emergency response equipment - servicing various pieces of emergency response equipment

REQUIRED SKILLS AND KNOWLEDGE

- storing various pieces of emergency response equipment.

Required knowledge

Knowledge and understanding of the emergency response procedures and equipment, sufficient to recognise standard and non-standard situations with regards to the equipment used, and then determine the appropriate action which is consistent with operating guidelines. These include:

- principles of operation of the emergency response equipment
- hazards policies and procedures
- emergency, fire and accident procedures.

Knowledge of the relevant OHS and environmental requirements, and enterprise standard operating procedures (SOPs), along with an ability to implement them in a manner that is relevant to emergency response practices. These include procedures for the use of personal protective clothing and equipment.

Evidence Guide**EVIDENCE GUIDE**

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

Critical aspects for assessment and evidence

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in

EVIDENCE GUIDE	
required to demonstrate competency in this unit	implementing appropriate action. The emphasis should be on the ability to minimise the affect of an emergency situation. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment in need of servicing are recognised • equipment is always 'made ready' • equipment is always stored in the designated location at all times when not in use • access to equipment is available at all times when not in use. These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus, with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities (eg HAZOP) and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, OHS and communication units.
Guidance information for assessment	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
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 if the

RANGE STATEMENT	
candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all items of equipment that are required for emergency response.
Emergency response equipment	Emergency response equipment may include: • fire extinguishers • fire hoses • fire blankets • pumps • branches, fittings and nozzles • foam equipment/units • personal protective clothing • breathing apparatus • deluge/safety showers.
Functions	Required functions include: • inspections • visual • mechanical • servicing • lubrication • pressure checks • refilling • communication • maintenance • external authorities.
Hazards	Hazards may include: • chemicals and hazardous materials • gases and liquids under pressure • moving machinery • materials handling • working at heights, in restricted or confined spaces, or • environments subjected to heat, noise, dusts or vapours.
Emergency situations	Emergency situations may include: • accidents

RANGE STATEMENT

	• fires • chemical or oil spills • gas leak or vapour emission • utilities failure • bomb scares.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	HSE

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOHS213B Undertake fire control and emergency rescue

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency is designed to allow a person to function as a member of an emergency response team in order to meet and respond to fire emergencies in an onshore and/or offshore facility.

Application of the Unit

Application of the unit	An ability to work under supervision or alone is required. This competency may be delivered as part of an induction program.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to demonstrate

essential outcomes of a unit of competency.	achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Respond to identified fire emergencies	1.1. Communicate the nature and extent of the fire emergency to team members in order to confirm required actions and responses 1.2. Apply knowledge of fire chemistry, fire characteristics and chemical hazards to assessment of the fire emergency and communicate the action required 1.3. Advise others of the nature and extent of the fire emergency from a knowledge of appropriate fire control strategies.
2. Deploy fire emergency equipment.	2.1. Utilise knowledge of the location and availability of fire fighting equipment in the control of a fire emergency 2.2. Select and utilise appropriate personal protective clothing and equipment and breathing apparatus by all team members 2.3. Apply appropriate fire fighting and containment media in a safe and coordinated manner, in accordance with the manufacturer specifications and the organisation's procedures, to attack and control the fire emergency.
3. Undertake search of and rescue from affected areas.	3.1. Confirm the need to conduct the search and rescue with team leaders or other nominated personnel 3.2. Conduct systematic primary and secondary searches 3.3. Search rooms and mark in accordance with the organisation's procedures 3.4. Lead occupants to safety 3.5. Locate injured personnel and transfer them in an appropriate manner to a safe location 3.6. Minimise the risk of further injury to affected personnel by applying casualty handling techniques and handing them to the care of medical personnel once clear of threat of fire 3.7. Communicate extent of injuries and casualty numbers to other support groups and request further assistance as required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to:

- correctly use relevant control and rescue equipment
- communicate effectively under stress
- react quickly and effectively to changing circumstances
- identify hazardous circumstances and conditions within the emergency
- apply local knowledge of plant layout and equipment.

Required knowledge

Knowledge and understanding of the process sufficient to recognise fire situations and then determine an action that is appropriate within operating guidelines and the scope of their responsibilities and competencies. It would be expected that a person would be able to communicate with team members the nature and extent of the fire and the actions required.

Demonstrated knowledge of:

- fire chemistry, fire characteristics and chemical hazards
- location and availability of fire fighting equipment
- appropriate personal protective clothing, equipment and breathing apparatus
- appropriate fire fighting and containment media
- casualty handling techniques.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal,

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	smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to minimise the effects of the critical situation. Consistent performance should be demonstrated. In particular look for evidence of: • ability to work effectively in a team • recognition of fire behaviour • impact of fire fighting tactics • conducting fire fighting operations in accordance with the organisation's safe work practices These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities (eg HAZOP) and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning

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	behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, OHS and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency would be applied by those persons who as a normal part of the work responsibilities and duties act as members of an emergency response team on an onshore or offshore facility. The person undertaking this competency must be able to work alone and also within an environment which requires a high level of teamwork and interpersonal communication. A person undertaking this unit of competency should be able to respond to directives given either by emergency team leaders or other team members in order to contain and control the emergency. This unit could be applied to any of the following installations or facilities: • onshore/offshore rig/installation • island based facility • floating production platform • onshore production, processing and/or storage facilities • pipeline easements • maintenance bases.

RANGE STATEMENT

Equipment may include:

- fire extinguishing agents and water curtains
- hoses
- mobile extinguishers
- stretchers
- personal protective clothing and equipment such as:
 - chemical protective clothing
 - distress alarms
 - structural fire protective clothing
- self contained breathing apparatus (SCBA)
- communication equipment.

Fire extinguishing media may include:

- water
- foam
- extinguishing powder
- gaseous extinguishing agents
- vapourising liquids
- other fire extinguishing substances.

On-scene hazards may include:

- smoke, darkness and heat
- electricity
- gas
- structural hazards
- structural collapse
- industrial - machinery, equipment, product
- hazardous products and materials
- unauthorised personnel.

Firefighting strategies and tactics may include:

- direct attack
- indirect attack
- combination attack
- exposure protection
- internal/offensive attacks
- confining the spread of fire
- rescuing occupants
- cooling the fuels
- removal of fuels
- interrupting the chemical chain reaction

RANGE STATEMENT	
	• exclusion of oxygen.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOHS214B Undertake helicopter safety and escape

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In an emergency scenario, a person traveling by helicopter to an offshore facility may have to exit the aircraft under abnormal conditions.

Application of the Unit

Application of the unit	This unit of competency is designed to improve the chance of an individual surviving a helicopter incident at sea through the application of thorough pre-flight preparation, the correct use of safety equipment, and appropriate helicopter safety techniques. This unit of competency would be applied to all persons who regularly travel by helicopter to any of the following installations or facilities: • offshore rig/installation • floating production vessel • support vessel • In an emergency the operations technician would: • escape from an inverted and/or submerged helicopter • don and successfully employ a life jacket • deploy safety and emergency equipment • deploy life rafts.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for flight.	1.1.Listen to and follow pre-flight instructions from pilot or boarding controller 1.2.Undertake pre-flight preparation including wearing appropriate clothing and personal safety equipment such as immersion suits and personal floatation devices (life jacket) 1.3.Check own gear for suitability including covered footwear, long trousers, and no loose items or hats 1.4.Check the supplied safety gear is fitted and worn correctly
2. Board the helicopter	2.1.Approach helicopter as directed by the pilot or ground crew 2.2.Put on seat belt and hearing protection. 2.3.Familiarise oneself with the helicopter layout 2.4.Locate and identify all the safety equipment 2.5.Locate and identify primary and secondary exits 2.6.Listen to instructions on emergency egress from the aircraft.
3. Prepare for helicopter ditching	3.1.Facilitate a controlled and safe egress from a ditched helicopter from a knowledge of helicopter layout, including the location and operation of emergency exits and equipment 3.2.Secure personal items within the cabin prior to the evacuation to facilitate escape 3.3.Check harnesses, seat belts and life jackets to ensure that they are properly fastened and secured prior to the ditching in order

ELEMENT	PERFORMANCE CRITERIA
	to minimise personal injury or gear failure 3.4. Adopt the required brace position in order to allow for proper positioning prior to ditching 3.5. Acknowledge and respond to information communicated by the helicopter crew advising the nature and extent of the situation.
4. Undertake evacuation from the helicopter	4.1. Identify appropriate primary and secondary escape routes in order to determine the locations through which the evacuation will be undertaken 4.2. Wait until rotors have stopped turning and all movement has ceased 4.3. Undo, in a controlled sequential manner seat belts and harnesses to facilitate exit from the helicopter 4.4. Deploy available safety equipment as instructed in order to assist the individual's sea survival after evacuation has been safely completed 4.5. Acknowledge and respond to information communicated by the helicopter crew advising the nature and extent of the situation.
5. Facilitate recovery process	5.1. Deploy position indicating devices and use appropriate signalling devices to facilitate the location of personnel by air-sea rescue group 5.2. Use emergency supplies and equipment to ensure that available supplies are maximised and are able to meet the nature and extent of the emergency 5.3. Apply appropriate helicopter/vessel rescue techniques to the recovery process.
6. Control hazards.	6.1. Identify and act upon potential hazards to minimise injury to personnel or damage to equipment 6.2. Manage use of life raft by applying a knowledge of life raft operation and requirements 6.3. Apply suitable swimming techniques (whilst wearing life jacket) in the water in order to aid movement and boarding of the deployed life raft 6.4. Rescue and recover persons in the water, minimising further potential for injury through the appropriate raft boarding and righting techniques. 6.5. Employ suitable techniques, both in the life raft and in the water, in order to delay the onset of hypothermia 6.6. Assess and treat hypothermia as required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to:

- correctly fit and wear required personal emergency equipment
- respond instantly to pilot commands
- deploy life rafts or other emergency equipment as commanded
- orient oneself whilst upside down under water
- remove as necessary doors or windows from the aircraft
- extricate oneself from the aircraft
- correctly inflate life jacket
- locate and gain access to life raft where deployed
- locate and link up with other survivors.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- helicopter escape techniques
- integral equipment functions to the level needed to act rationally and recognise and resolve problems
- hazards boarding and departing from helicopters under normal and emergency situations
- inverted and submerged helicopter escape techniques
- life jacket operation
- emergency equipment deployment techniques
- life raft operation and deployment
- rescue and recovery techniques
- hypothermia prevention and reduction techniques (delaying and offsetting).

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will involve a

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	helicopter simulator. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations. Simulation should be based on actual helicopter ditchings and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of the aircraft's survival systems and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to safely get out of the helicopter following an incident at sea.
Context of and specific resources for assessment	Assessment will require access to a suitable helicopter simulator. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	It may be appropriate to assess this unit concurrently with relevant teamwork, OHS and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the helicopter escape system. For your circumstances this may include: • helicopter simulators • beacons • life rafts • distress flares • life jackets • EPIRB.
Typical problems	Typical problems for your situation may include: • jammed or damaged survival equipment • personal injury or injury to others • trapped personnel • loose or damaged equipment • adverse weather conditions.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through

RANGE STATEMENT

environment (HSE)	State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOHS215B Apply offshore facility abandonment and sea survival procedures and practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In an emergency scenario personnel on an off-shore facility may be required to abandon his/her station due to an on-site emergency and then survive at sea.

Application of the Unit

Application of the unit	This unit of competency is designed to allow persons to improve their chances of survival through the application of agreed sea survival techniques and strategies following abandonment of the facility. Offshore facilities may include: • offshore rig or platform • floating production vessel. • Personnel may be required to select and deploy the appropriate safety equipment, launch available sea-going survival craft, assist in the survival of other persons, and activate location beacons or homing devices. Generally the operations technician would be part of a team. They would be expected to be capable of performing all facets of the competency whilst following site specific procedures. At all times they would be liaising and communicating with relevant team members.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for abandonment of the offshore facility	1.1. Acknowledge alarm systems and proceed to muster and/or evacuation area as appropriate 1.2. Make evacuation area safe to ensure likelihood of personal injury or equipment damage is minimised 1.3. Select and apply appropriate personal flotation device (life jacket) and other equipment 1.4. Prepare for evacuation by applying appropriate methods and means of evacuation.
2. Abandon the offshore facility	2.1. Deploy safety/rescue equipment in a safe and controlled manner before commencing abandonment. 2.2. Abandon the facility in accordance with relevant safety requirements and procedures 2.3. Enter life raft or other survival craft appropriately 2.4. Depart promptly from the facility using agreed techniques and in a safe and controlled manner. 2.5. Utilise appropriate safe water entry procedures.
3. Manage the survival process	3.1. Identify and act upon potential hazards to minimise injury to personnel or damage to equipment 3.2. Manage use of life raft by applying a knowledge of life raft operation and requirements 3.3. Apply suitable swimming techniques (whilst wearing life jacket) in the water in order to aid movement and boarding of the deployed life raft 3.4. Rescue and recover persons in the water, minimising

ELEMENT	PERFORMANCE CRITERIA
	further potential for injury through the appropriate raft boarding and righting techniques 3.5. Employ suitable techniques, both in the life raft (or other survival craft) and in the water, in order to delay the onset of hypothermia 3.6. Assess and treat hypothermia as required.
4. Facilitate the recovery process	4.1. Deploy position indicating devices and use appropriate signaling devices to facilitate the location of personnel by air-sea rescue group 4.2. Use emergency supplies and equipment to ensure that available supplies are maximised and are able to meet the nature and extent of the emergency 4.3. Apply appropriate helicopter/vessel rescue techniques to the recovery process.
5. Control hazards	5.1. Identify hazards relevant to the abandonment process 5.2. Assess the risks arising from those hazards 5.3. Implement measures to control those risks in line with procedures and duty of care.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
Competence includes the ability to and be able to distinguish between causes of problems/alarms/fault indications such as: • delayed deployment of survival craft • life jacket malfunctions or failures • failure of life craft to deploy correctly • inability of life raft to right itself after overturning • safety equipment malfunctions • individual and group hypothermia.
Required knowledge
The knowledge referred to in the Evidence Guide for this unit includes: • offshore facility abandonment procedures

REQUIRED SKILLS AND KNOWLEDGE

- safe water entry procedures
- life jacket operation
- correct life raft and other survival craft deployment
- life raft operation and management
- boarding and righting a life raft
- safety and emergency equipment deployment techniques
- safety and emergency equipment operation
- use of life-jackets
- hypothermia prevention and reduction techniques (delaying and offsetting)
- rescue and recovery techniques.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will involve an abandonment simulation. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation should be based on an actual abandonment and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of survival equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk- throughs of abnormal

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	operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The critical aspect of this competence is the preservation of life under adverse circumstances. Competence must be demonstrated in the ability to assist or to safely get oneself and others off an off-shore facility following an incident at sea and to survive in the water.
Context of and specific resources for assessment	As a general rule assessment will require access to an appropriate emergency evacuation training facility which has the capacity to gather evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It may be appropriate to assess this unit concurrently with: <i>PMAOHS214B Undertake helicopter safety and escape.</i>
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

RANGE STATEMENT	
standards	
Context	This unit of competency includes all such items of equipment and unit operations which form part of the survival process. For your situation this may include: • life rafts and life raft deployment devices • emergency descent devices • position indicating devices • signalling devices • scramble nets and ladders • helicopter lifting strops • rescue harnesses. Typical problems might include: • failure of safety equipment • interaction with heat or debris • prolonged exposure to the elements • risk of hypothermia.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOHS221B Maintain First Aid supplies and records

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency unit deals with the responsibilities in ensuring that adequate supplies of First Aid equipment and resources, and records, are maintained. The person may or may not necessarily be responsible for the ordering and purchasing of equipment and resources, depending upon the workplace organisational structure.

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Maintain resources	1.1. Ensure and secure, availability of adequate and relevant resources in accordance with workplace procedures 1.2. Identify and obtain non consumables required by workplace to maintain adequate readiness of supplies 1.3. Identify and obtain consumables required by workplace to maintain adequate readiness of supplies 1.4. Check stock and regularly carry out inspection of equipment for condition and currency 1.5. Recover and clean equipment and dispose of waste safely according to legislative and site procedures 1.6. Maintain resources in operational readiness in accordance with workplace procedures 1.7. Store resources in correct manner to ensure their future operation and serviceability.
2. Record and manage records	2.1. Complete relevant forms as required according to legislation and site procedures 2.2. Store forms in accordance with legislative and site procedures 2.3. Send relevant forms to appropriate bodies, file records appropriately and undertake security of such records according to workplace and legislative requirements 2.4. Maintain confidentiality of records and information in accordance with privacy principles and statutory and/or organisational policies.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- completing plant records
- communication
- stocktaking
- following procedures.

Required knowledge

Knowledge and understanding of the materials and equipment required sufficient to recognise variance from requirements and then determine an appropriate action within the scope of their responsibilities and competencies.

Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards. These would include:

- OHS legislation and regulations
- legal responsibilities and duty of care
- policies and procedures
- cleaning agents
- stock control
- waste disposal
- transportation techniques
- use of referral networks
- gaining access to materials safety data sheets (MSDSs).

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

EVIDENCE GUIDE	
	Assessment will occur over a range of situations that will include disruptions to normal, smooth operation. Where applicable, assessment should replicate workplace conditions as far as possible. Where, for reasons of safety, access to equipment and resources and space, assessment takes place away from the workplace, simulations should be used to represent workplace conditions as closely as possible.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence may be demonstrated working individually, under supervision or as part of a First Aid team.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant technical units. Competence may be assessed in conjunction with other industry units of competency such as: • record management • stock control • administration • office procedures.
Guidance information for assessment	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
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

RANGE STATEMENT	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit would be undertaken in a plant or remote facility where there are First Aid stations requiring monitoring and re-supply.
First Aid resources	First Aid resources may include but not be limited to: • Non consumables • machines • books • reference materials • MSDS resources including Workplace Health & Safety Act • legislative regulations • stretchers • communication systems • relevant texts • equipment. • Consumables • First Aid kits (bandages, tape, scissors, splinter removers, antiseptic, eye management, disinfectants, emergency numbers and contacts, etc) • dressings • ointments • cold packs • analgesics • splints • sharps disposal • biohazardous waste • medical grade oxygen • bandages • medication • personal protection equipment • eye wash • disinfectants • broncho-dilators • cervical collars.

RANGE STATEMENT	
Legislation	Legislation may include but not be limited to: • occupational health and safety legislation • regulations and codes of practice • industrial relations legislation • environmental legislation.
Codes of Practice	Codes of practice may include, but not be limited to: • industry codes • industry standards • company procedures • State and Territory health and safety authorities.
Forms	Relevant forms may include, but not limited to: • incident/injury forms • casualty history forms • disease notification • Workcover forms • medication registers • workers' compensation • day book • pre participation records (sport) • medical histories • management records • stock records • infection control records • training records.
Policies and Procedures	Policies and procedures may be from organisations such as: • Australian Resuscitation Council (ARC) • National Health and Medical Research Council (NHMRC) • company standard operating procedures (SOPs) • Australian Standards • Worksafe Australia.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	HSE

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOHS310B Investigate incidents

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency unit refers to the investigation of incidents that occurred at the workplace. These incidents can vary from large to small, completely internal or partially externally coordinated. They include, but are not limited to, all types of emergencies, fires, OHS and/or environmental incidents.

Application of the Unit

Application of the unit	In a typical scenario, minor incidents which are subject to internal investigation will be conducted by the plant operator/technician, and for a more major investigation, or one subject to external investigation, he/she will assist with the investigation and/or undertake identified parts of the investigation. The exact definition of the scope of responsibility will depend on company policy, as will the level of the person undertaking these investigations. These investigations will be in accordance with company procedures for such investigations which will be consistent with any relevant regulations.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Monitor and review emergency situation	1.1.Undertake site inspections of incident scene 1.2.Communicate with relevant personnel regarding specific aspects of the emergency situation 1.3.Monitor corrective action procedures 1.4.Communicate changes to the situation to appropriate personnel.
2. Record investigation process and results as appropriate	2.1.Establish and secure boundaries of the incident scene to prevent contamination of prospective evidence/exhibits 2.2.Identify and interview persons relevant to the incident 2.3.Identify and record evidence/exhibits at the scene prior to examination to ensure continuity 2.4.Assess relevant information, documentation and evidence/exhibits 2.5.Determine point of origin and most likely cause of incident of the emergency 2.6.Determine risk factors affecting the emergency 2.7.Identify and analyse a range of other possible causes 2.8.Identify and utilise support services to investigate the incident scene 2.9.Process, record and communicate information/evidence/exhibits, forms and documents to appropriate personnel following enterprise policies and procedures.
3. Make suggestions to	3.1.Identify and assess tactical factors and resulting priorities

ELEMENT	PERFORMANCE CRITERIA
improve handling of emergency situation	occurring during the emergency 3.2. Formulate appropriate suggestions to improve handling of similar emergency situation based upon information available 3.3. Identify obvious problems in related plant area and make an appropriate contribution to their solution.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to apply and describe or explain:

- factors affecting fire behaviour
- characteristics of fire and fuel types
- security of an incident scene
- examination of an incident scene
- collection of physical evidence
- workplace documentation and recording systems
- use of personal protective equipment
- liaison techniques with third parties
- workplace procedures and work instructions
- company policies regarding health and safety and environment
- hazard identification, assessment and control of risk
- basic risk assessment of workplace jobs/tasks
- environmental impacts likely to arise from activities
- measures for eliminating and/or reducing impacts on the environment.

Required knowledge

Knowledge and underpinning skills are required in:

- communication (listening, questioning) and negotiation in questioning witnesses
- analytical and decision making skills
- problem solving skills in responding to a range of emergency situations
- exhibit handling and preserving continuity of evidence
- witness management, in particular demonstration of ethical behaviour and cultural awareness.

REQUIRED SKILLS AND KNOWLEDGE

Knowledge and understanding of the investigation of incidents sufficient to recognise and assess causes of emergency situations and then to determine improvements to the actual response within the scope and level of the IR responsibilities and competencies.

A demonstrated working knowledge and application of the company-specific work organisations and workflow would be highly regarded. An ability to coordinate own work and the work of other team members is also regarded as a component of this unit of 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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action within the scope and level of their

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	responsibilities and competencies. Consistent performance should be demonstrated. In particular look to see that wherever possible: • the scene is secure and evidence is preserved • evidence is collected in accordance with legislative requirements • point of origin and most likely cause of incident is determined • a range of other possible causes can be identified and analysed • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution • emergency reporting procedures are understood and followed. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities (eg HAZOP) and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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

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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Job safety and environment analysis will be conducted in accordance with required company procedures and policies. This competency covers process manufacturing plants which may involve workplace hazards such as: - chemicals and hazardous materials - gases and liquids under pressure - moving machinery - materials handling - working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours.
Incidents/emergencies	Incidents/emergencies may include, but are not limited to: - accidents - fire - chemical or oil spills - gas leak or vapour emission - utilities failure - bomb scares - OHS incidents - environmental incidents.
Enterprise policies and procedures	Enterprise policies and procedures include those which directly or indirectly cover emergency situations, such as: - emergency, fire and accident procedures - hazard policies and procedures - standard operating procedures (SOPs) - safety procedures - work instructions - personal protective clothing and equipment procedures.
Evidence gained	Evidence gained as a result of investigations may include: video tapes

RANGE STATEMENT	
	• audio tapes • drawings • photographs • plans • manifests • relevant documents • personal notes • physical evidence/materials • debris • soil.
Support services	Support services may include incident scene specialists: • pathologists • forensic investigators • coroner • government medical officers • interpreters • technical services • legal officers • undertakers • forensic accountants • information technology consultants • document examiners • handwriting experts • financial organisations • external law enforcement agencies.
Interview strategies	Interview strategies may vary but require consideration of: • location • timing • method (direct questioning, empathetic questioning) • strategies for developing rapport • who is being interviewed • exclusion of leading questions • avoidance of cross-examination.
Legal and policy requirements	Legal and policy requirements differ according to the status of the person being interviewed. Such requirements may include: • the presence of a solicitor, independent person, family member or interpreter • special consideration that applies disabled, child, parent, age, gender, ethnicity and race.

RANGE STATEMENT	
Post investigation documentation	Post investigation documentation may include: • statements • proformas • photographs • tape recordings.
Designated personnel	Designated personnel for incident investigation referrals may include: • employer • personnel directly involved in responding to the incident, including: • first response personnel • emergency response team members • emergency team leader(s) • First Aid officers • other personnel with emergency team leader responsibilities.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOHS311B Lead emergency teams

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency applies to an individual required to lead and coordinate an emergency team, including deployment of resources at the scene of an emergency.

Application of the Unit

Application of the unit	A person undertaking this unit of competency would be normally nominated to assume the responsibility of emergency team leader. Typically they would be leading an incident response or fire emergency response team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Assess the nature and extent of the emergency	1.1. Determine the nature and extent of the emergency in order to ascertain the level and degree of the emergency and what required actions and management strategies should be implemented 1.2. Communicate the nature and extent of the emergency in a timely and appropriate manner to other nominated emergency or facility personnel 1.3. Facilitate the rescue of personnel at risk, control/extinguish the emergency and to make the affected area safe through application of rescue and control strategies 1.4. Ensure all team members are adequately instructed, protected and equipped to function safely and effectively in the emergency situation through the application of personal protective equipment.
2. Effect rescue of personnel at risk.	2.1. Instruct rescue teams to effect the search for, and rescue of, personnel identified as being at risk 2.2. Allocate resources to potentially exposed or threatened personnel and assets, and minimise the likelihood of escalation of the risk.
3. Confine the spread of emergency	3.1. Initiate control/extinguishing responses promptly in order to eliminate the emergency 3.2. Render affected areas safe in order to prevent the likelihood of further re-occurrence, or threat to personnel or assets 3.3. Provide feedback to facility or other nominated personnel concerning the status of the emergency.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE	
This describes the essential skills and knowledge and their level, required for this unit.	
Required skills	
A person undertaking this competency must be able to demonstrate: • leadership skills • organisation skills • planning skills • team management skills • hazard awareness and safety awareness skills • communication skills.	
Required knowledge	
Knowledge and understanding of the process sufficient to recognise emergency situations and then determine an action that is appropriate within operating guidelines and the scope of their responsibilities and competencies. It would be expected that a person would be able to communicate with team members the nature and extent of the emergency and provide the actions required. Demonstrated knowledge of: • characteristics of fires and fuel types • hazard identification, assessment and control of risk • principles and procedures of self contained breathing apparatus (SCBA) • search and rescue techniques (including self rescue techniques) • relevant facility fire management and safety systems • communication systems • emergency response plans • teamwork principles and techniques.	

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated

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	competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to minimise the effects of the critical situation. Consistent performance should be demonstrated. In particular look for: • ability to work effectively as a team and as a team leader • recognition of the behaviour of fire and other emergency situations • impact of emergency tactics • evidence that emergency operations are conducted in accordance with the organisation's safe work practices. These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities (e.g. HAZOP) and similar sources.

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Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	The skills and knowledge contained within this unit of competency could be utilised as a normal part of a person's responsibilities and duties. In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It would be expected that a person undertaking this competency would have completed or be able to demonstrate competence in the following unit of competency before undertaking this unit: • <i>MSAPMOHS212A Undertake first response to fire incidents</i> • <i>PMAOHS213B Undertake fire control and emergency rescue.</i>
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

RANGE STATEMENT**Context**

Those persons who normally operate or are based permanently or regularly assigned to an onshore or offshore installation or facility and lead an emergency response team would require this unit of competency.

This unit could be applied to any of the following installations or facilities:

- onshore/offshore rig/installation
- island based facility
- floating production vessel or platform
- onshore production, processing and/or storage facilities
- pipeline easements
- maintenance bases.

This competency covers process manufacturing plants which may involve workplace hazards such as:

- chemicals and hazardous materials
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours.

Emergency situations may include:

- accidents
- fires
- chemical or oil spills
- gas leak or vapour emission
- utilities failure
- bomb scares.

Equipment may include:

- fire extinguishing agents and water curtains
- hoses
- mobile extinguishers
- stretchers
- personal protective clothing and equipment such as:
 - chemical protective clothing
 - distress alarms
 - structural fire protective clothing
- self contained breathing apparatus (SCBA)
- communication equipment.

Emergency extinguishing media may include:

- water

RANGE STATEMENT

- foam
- extinguishing powder
- gaseous extinguishing agents
- vapourising liquids
- other fire extinguishing substances.

On-scene hazards may include:

- smoke, darkness and heat
- electricity
- gas
- structural hazards
- structural collapse
- industrial - machinery, equipment, product
- hazardous products and materials
- unauthorised personnel.

Emergency strategies and tactics may include:

- direct attack
- indirect attack
- combination attack
- exposure protection
- internal/offensive attacks
- confining the spread of incident
- rescuing occupants
- cooling the fuels
- removal of fuels
- interrupting the chemical chain reaction
- exclusion of oxygen.

Relevant facility fire management and safety systems include:

- fire management systems
- communication systems
- relevant facility emergency management and contingency response plans.

Relevant legislative and safety case management principles and agreements must be adhered to.

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	HSE

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOHS312B Command the operation of survival craft

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	Operations technicians undertaking offshore operations can sometimes require evacuation involving the use of water craft and survival at sea. Due to the isolation of offshore installations and facilities, offshore evacuation procedures involve significant differences from standard onshore evacuation procedures.

Application of the Unit

Application of the unit	An essential part of this offshore evacuation process is the use of totally enclosed motorised personnel survival craft (TEMPSC) to facilitate the removal of personnel from an unsafe or threatened facility. Installations and facilities can include: • offshore rig/installation • floating production platforms. Some operations technicians will be allocated responsibility for the coordination and supervision of the evacuation process. These personnel would: • coordinate and facilitate the assembly, boarding and launch of TEMPSC • operate communications and navigation systems • operate, manoeuvre and navigate TEMPSC to facilitate safe evacuation and recovery of personnel. Generally the operations technician would be part of a team. However in an emergency they may be expected to be capable of performing all parts of this unit on an individual basis.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	MSAPMOHS220A	<i>Provide initial First Aid response</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Control muster	1.1. Convey information from the control centre concerning the nature and scope of the emergency 1.2. Confirm and verify personnel gathered at the muster point against current person-on-board lists 1.3. Confirm personnel and craft readiness status with the incident controller 1.4. Maintain control of the muster point in order to ensure that an orderly and safe evacuation is achieved.
2. Conduct organised deployment of TEMPSC.	2.1. Direct mustered personnel to board the craft to procedures 2.2. Check all personnel to ensure that they are safely secured within craft and all required safety equipment has been verified as operational prior to launch 2.3. Launch craft to procedure, ensuring the safety of all personnel is maintained during the launch 2.4. Manoeuvre the launched craft away from the facility/ installation to a pre-determined location, safe holding area or distance

ELEMENT	PERFORMANCE CRITERIA
	2.5.Utilise all equipment to assist in the safe operation of the craft 2.6.Communicate with nominated agencies and services in order to convey the position and condition of craft and personnel and to assist in the recovery of the craft.
3. Provide leadership in TEMPSC deployment and welfare of personnel	3.1.Take command of the TEMPSC and oversight the welfare and safety of those on board 3.2.Determine disposition of personnel within the TEMPSC and see to the allocation of resources 3.3.Communicate with other survival craft and base station in order to facilitate self rescue and recovery of others in the affected area 3.4.Prepare craft and personnel for safe recovery by the appropriate methods.
4. Control hazards	4.1.Identify hazards arising from the abandonment 4.2.Assess the risks arising from those hazards 4.3.Implement measures to control those risks in line with procedures and duty of care.
5. Respond to problems	5.1.Identify possible problems 5.2.Determine problems needing action 5.3.Determine possible problem causes 5.4.Rectify problem using appropriate solution within area of responsibility 5.5.Follow through items initiated until final resolution has occurred 5.6.Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the emergency evacuation system and to distinguish between causes of problems/alarm/fault indications such as:

REQUIRED SKILLS AND KNOWLEDGE

- communications equipment problems
- location beacon malfunctions
- listing or other floatation difficulties
- mechanical failures.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- principles involved in the launching, handling and recovery of survival craft
- factors needing to be taken into account during the operation of survival craft in all types of weather conditions
- operation of all equipment normally contained within a survival craft.
- emergency response plans and procedures
- evacuation procedures and alarms
- all items on a schematic of the facility or installation layout
- safety equipment and survival craft locations (TEMPSC)
- procedures for loss of command situations.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be in a simulated environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal and planned operation.

Simulation should be based on survival craft and launching systems relevant to the particular facility/installation and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems.

This unit of competency requires an application of the

EVIDENCE GUIDE	
	knowledge contained in the use of survival craft and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • application of emergency response plans and procedures, evacuation procedures and alarms is in accordance with procedures • there is control and coordination of evacuation muster activities • safe and timely initiation of facility evacuation activities occurs • operation, including navigation and safe handling of emergency craft conforms to established emergency response. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating TEMPSC which must be available and equipped for deployment. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all facilities it may be appropriate to assess this unit

EVIDENCE GUIDE	
	concurrently with: <i>PMAOHS215B Apply offshore facility abandonment and sea survival procedures and practices.</i>
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the evacuation procedure including: totally enclosed motorised personnel survival craft (TEMPSCs) launch and retrieval systems. Typical problems for your installation may include: - a range of weather conditions - communication systems failures - malfunctioning equipment - unaccounted for personnel - launching difficulties.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMAOHS320C Provide advanced First Aid response

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency unit deals with the provision of advanced First Aid response, including life support. It covers the assessment of the situation, management of casualty(s), coordination of First Aid activities until the arrival of medical or other assistance, and provision of support to other providers.

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	MSAPMOHS220A	<i>Provide initial First Aid response</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to demonstrate

essential outcomes of a unit of competency.	achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Assess the situation	1.1. Identify physical hazards and minimise according to OHS requirements and workplace procedures 1.2. Assess risks to First Aider and others and determine appropriate response to ensure prompt control of situation 1.3. Ascertain and prioritise need for emergency services/medical assistance and undertake triage where required
2. Manage the casualty(s)	2.1. Seek agreement for management of casualty injury/illness from appropriate person(s), where relevant 2.2. Determine welfare procedure and implement according to casualty needs 2.3. Control effects of injury and determine appropriate First Aid management to meet the needs of the casualty and situation 2.4. Administer medication according to relevant legislation and manufacturer/supplier instructions and subject to casualty regime 2.5. Monitor and respond to casualty condition in a timely manner in accordance with effective First Aid principles 2.6. Correctly operate life support equipment where appropriate, according to relevant legislation and manufacturer/supplier instructions 2.7. Finalise management according to casualty needs and First Aid principles.
3. Coordinate First Aid activities until arrival of medical assistance	3.1. Identify available resources and establish communication links with appropriate emergency management services and medical assistance personnel as appropriate 3.2. Deploy correct amount of resources to appropriate locations in an effective manner to ensure timely arrival of required resources 3.3. Document provision of resources and recommend

ELEMENT	PERFORMANCE CRITERIA
	modifications 3.4. Monitor management of casualties in accordance with First Aid principles and workplace procedures 3.5. Coordinate evacuation of casualties according to worksite evacuation procedures 3.6. Arrange support service for personnel involved in the incident in accordance with workplace principles and procedures.
4. Communicate essential incident details	4.1. Maintain communication with relevant personnel using appropriate media and equipment 4.2. Communicate First Aid information with other providers/carers as appropriate to meet their needs and in accordance with workplace procedures 4.3. Provide information calmly to reassure casualty, adopting a communication style to match casualty level of consciousness.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Correct use/application of First Aid principles and procedures including:

- resuscitation
- the use of semi automated defibrillator
- delivery of oxygen
- adequate infection control procedures
- safe manual handling
- consideration of the welfare of the casualty
- initial casualty assessment
- incident management
- infection control
- bleeding control
- airway management
- care of unconscious.

Use of various First Aid resources and equipment.

REQUIRED SKILLS AND KNOWLEDGE

Communication skills, including:

- use of various communication systems, eg two way radios, mobile and satellite phones, etc
- report preparation
- the ability to interpret and use required forms/documentation.

Leadership and decision making ability

Required knowledge

Knowledge and understanding of basic life support principles and measures sufficient to recognise emergency situations and then determine appropriate action within the scope of their responsibilities and competencies. These include:

- basic anatomy and physiology
- respiratory/circulatory system
- basic toxicology.

Knowledge of relevant State and Territory regulatory requirements, occupational health and safety (OHS) legislation and regulations, and company standard operating procedures (SOPs). These include:

- legal responsibilities and duty of care
- how to gain access to and interpret material safety data sheets (MSDSs)
- debriefing counselling procedures
- dealing with social problems and confidentiality
- capabilities of emergency management services
- transport facilities.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Assessment will occur over a range of situations that

EVIDENCE GUIDE	
	will include disruptions to normal, smooth operation. Where applicable, assessment should replicate workplace conditions as far as possible. Where, for reasons of safety, access to equipment and resources and space, assessment takes place away from the workplace, simulations should be used to represent workplace conditions as closely as possible. Consistency of performance should be maintained over the required range of workplace situations until renewal of competence/license is required by the industry/organisation.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence may be demonstrated working individually, under supervision or as part of a First Aid team.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with other OHS units.
Guidance information for assessment	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
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

RANGE STATEMENT	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	First Aid management will need to account for: • workplace policies and procedures • industry/site specific regulations, codes etc • OHS requirements • State and Territory workplace health and safety requirements • allergies casualty may have.
Hazards	Physical hazards may include: • workplace hazards • environmental hazards • proximity of other people • hazards associated with casualty management process.
Risks	Risks may include: • worksite equipment, machinery and substances • First Aid equipment (oxygen cylinders, defibrillator) • environmental risks • bodily fluids • risk of further injury to the casualty • risks associated with the proximity of other workers and bystanders.
Injuries and conditions managed	Casualty condition is managed for: • abdominal injuries • allergic reactions • bleeding • burns - thermal, chemical, friction, electrical • cardiac conditions • chemical contamination • cold injuries • crush injuries • dislocations • drowning • envenomation - snake, spider, insect and marine bites • environmental conditions such as hypothermia, dehydration, heat stroke • epilepsy, diabetes, asthma and other medical conditions

RANGE STATEMENT	
	• eye injuries • fractures • head injuries • insect/marine bites • minor skin injuries • neck and spinal injuries • needle stick injuries • poisoning and toxic substances • respiratory management of asthma and/or choking • shock • smoke inhalation • soft tissue injuries, including sprains, strains, dislocations • substance abuse, illicit drugs • unconsciousness, including not breathing and no pulse.
First Aid responses	First Aid management may include: • administration of analgesic gases • cardiopulmonary resuscitation (CPR) • infection control • semi-automatic external defibrillator (SAED) • expired air resuscitation (EAR).
First Aid principles	Established First Aid principles include: • checking the site for danger to self, casualty and others minimising the danger • checking and maintaining casualty's airway, breathing and circulation
Variables	First Aid management will need to account for: • location and nature of the workplace • the environmental conditions, eg electricity, biological risks, weather, motor vehicle accidents • location of emergency service personnel • the use and availability of First Aid equipment and resources • infection control.
Medication	Medication may include: • oxygen • pain relief - paracetamol in accordance with State and Territory legislation, analgesics (penthrane, entonox - used in mining industry) • asthma - aerosol bronchodilators: casualty's own or from First Aid

RANGE STATEMENT	
	kit in accordance with State and Territory legislation • severe allergic reactions - adrenaline: subject to casualty's own regime • heart attack - aspirin.
Resources and equipment	Resources and equipment are used appropriate to the risk to be met and may include: • blood pressure cuff • oxygen resuscitation/cylinders • defibrillation units • pressure bandages • thermometers • injections • backboards • stretchers • soft bag resuscitator • First Aid kits • eyewash • thermal blankets • pocket face masks • rubber gloves • dressing • spacer device • cervical collars.
Communication systems	Communication systems may include but are not limited to: • mobile phones • satellite phones • HF/VHF radio • flags • flares • two-way radio • email • electronic equipment.
Documentation	Documentation may cover: • time • fluid intake/output • blood • vomit • faeces

RANGE STATEMENT	
	• urine • administration of medication, including time, date, person administering, dose • vital signs.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	HSE

Competency field

Competency field	

Co-requisite units

Co-requisite Units	

PMAOHS321B Provide First Aid response in remote and/or isolated area

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency unit covers the provision of First Aid response including life support and the management of casualty(s) in a remote and/or isolated area until evacuation of the casualty(s) by emergency services.

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	MSAPMOHS220A	<i>Provide initial First Aid response</i>

Employability Skills Information

Employability skills	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, further information is detailed in the required skills and knowledge

a unit of competency.	section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify possible contingencies at remote/ isolated area	1.1.Undertake preparation for isolated travel or work accounting for expected contingencies according to procedures/policies.
2. Handle casualty's immediate condition	2.1.Assess casualty's condition and determine appropriate response in order to minimise hazards and determine need for medical assistance 2.2.Monitor and respond to casualty's condition in accordance with appropriate First Aid principles 2.3.Reassure and support casualty during the wait for medical assistance 2.4.Ensure and determine casualty's comfort by establishing and explaining the nature of the illness/injury and the management procedures 2.5.Undertake to provide shelter from elements in accordance with environmental conditions.
3. Liaise with external medical support	3.1.Document condition of the casualty over time to assist on-going management 3.2.Establish communication links to medical services to ensure prompt control action is undertaken 3.3.Undertake administration of medication under medical instruction, using relevant communication equipment 3.4.Evaluate environmental and casualty's condition to determine transportation requirements of casualty to medical assistance 3.5.Provide assistance in the evacuation of casualty by emergency services as required.
4. Evaluate the incident	4.1.Evaluate management of the incident and where required develop an action plan in consultation with relevant parties 4.2.Participate in debriefing/evaluation to improve future operations and address individual's needs 4.3.Provide access to bona fide critical stress facilitators where required/requested 4.4.Implement site management/procedures and evaluate in

ELEMENT	PERFORMANCE CRITERIA
	accordance with risk assessment 4.5. Formulate contingency planning and review to identify and select alternative management principles.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Correct use/ application of First Aid principles and procedures including:

- resuscitation
- the use of semi automated defibrillator
- delivery of oxygen
- adequate infection control procedures
- safe manual handling
- consideration of the welfare of the casualty
- initial casualty assessment
- incident management
- infection control
- bleeding control
- airway management
- care of unconscious.

Use of various First Aid resources and equipment

Communication skills, including:

- use of various communication systems, eg two-way radios, mobile and satellite phones etc
- report preparation
- the ability to interpret and use required forms/documentation.

Leadership and decision making ability.

Required knowledge

Knowledge and understanding of basic life support principles and measures sufficient to recognise emergency situations and then determine appropriate action within the scope of their responsibilities and competencies. These include:

- basic anatomy and physiology
- respiratory/circulatory system

REQUIRED SKILLS AND KNOWLEDGE

- basic toxicology.

Knowledge of relevant State and Territory regulatory requirements, occupational health and safety (OHS) legislation and regulations, and company standard operating procedures (SOPs). These include:

- legal responsibilities and duty of care
- how to gain access to and interpret material safety data sheets (MSDSs)
- debriefing counselling procedures
- dealing with social problems and confidentiality
- capabilities of emergency management services
- transport facilities.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Assessment will occur over a range of situations that will include disruptions to normal, smooth operation.

Where applicable, assessment should replicate workplace conditions as far as possible. Where, for reasons of safety, access to equipment and resources and space, assessment takes place away from the workplace, simulations should be used to represent workplace conditions as closely as possible. Consistency of performance should be maintained over the required range of workplace situations until renewal of competence/license is required by the industry/organisation.

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

Competence may be demonstrated working individually, under supervision or as part of a First Aid team.

EVIDENCE GUIDE	
unit	
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	First Aid management will need to account for: - workplace policies and procedures - industry/site specific regulations, codes etc - occupational health and safety requirements - State and Territory workplace health and safety requirements - allergies the casualty may have.
Hazards	Physical hazards may include: - workplace hazards - environmental hazards

RANGE STATEMENT	
	hazards associated with the casualty management process.
Risks	Risks may include: - worksite equipment, machinery and substances - First Aid equipment (oxygen cylinders, defibrillator) - environmental risks - bodily fluids - risk of further injury to the casualty - risks associated with the proximity of other workers and bystanders.
Injuries and conditions managed	Casualty condition is managed for: - abdominal injuries - allergic reactions - bleeding - burns - thermal, chemical, friction, electrical - cardiac conditions - chemical contamination - cold injuries - crush injuries - dislocations - drowning - envenomation - snake, spider, insect and marine bites - environmental conditions such as hypothermia, dehydration, heat stroke - epilepsy, diabetes, asthma and other medical conditions - eye injuries - fractures - head injuries - insect/marine bites - minor skin injuries - neck and spinal injuries - needle stick injuries - poisoning and toxic substances - respiratory management of asthma and/or choking - shock - smoke inhalation - soft tissue injuries, including sprains, strains, dislocations - substance abuse, illicit drugs - unconsciousness, including not breathing and no pulse.
First Aid responses	First Aid management may include:

RANGE STATEMENT	
	• administration of analgesic gases • cardiopulmonary resuscitation (CPR) • infection control • semi-automatic external defibrillator (SAED) • expired air resuscitation (EAR). • Established First Aid principles include: • checking the site for danger to self, casualty and others and minimising the danger • checking and maintaining casualty's airway, breathing and circulation.
Variables	First Aid management will need to account for: • location and nature of the workplace • the environmental conditions, eg electricity, biological risks, weather, motor vehicle accidents • location of emergency service personnel • the use and availability of First Aid equipment and resources • infection control.
Medication	Medication may include: • oxygen • pain relief - paracetamol in accordance with State and Territory legislation, analgesics (penthrene, entonox - used in mining industry) • asthma - aerosol bronchodilators: casualty's own or from First Aid kit in accordance with State and Territory legislation • severe allergic reactions - adrenaline: subject to casualty's own regime • heart attack - aspirin.
Resources and equipment	Resources and equipment are used appropriate to the risk to be met and may include: • blood pressure cuff • oxygen resuscitation/cylinders • defibrillation units • pressure bandages • thermometers • injections • backboards • stretchers • soft bag resuscitator • First Aid kits

RANGE STATEMENT	
	• eyewash • thermal blankets • pocket face masks • rubber gloves • dressing • spacer device • cervical collars.
Communication systems	Communication systems may include but are not limited to: • mobile phones • satellite phones • HF/VHF radio • flags • flares • two way radio • email • electronic equipment.
Travel	• Consideration to travel or wait would depend upon: • severity of injury • time required for medical assistance to arrive <i>Note:</i> movement might hinder rescue procedures Preparation for travel may include: • selection of relevant communication equipment and • relevant First Aid supplies and resources to cater for environmental conditions.
Documentation	Documentation may cover: • time • fluid intake/output • blood • vomit • faeces • urine • administration of medication, including time, date, person administering, dose • vital signs.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance

RANGE STATEMENT

	Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	HSE

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMAOHS420B Develop First Aid procedures and manage resources

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency unit encompasses the management of procedure development and the implementation of effective systems for human and physical resources to ensure that First Aid can be effectively and efficiently provided in the workplace.

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Develop effective organizational systems	1.1. Coordinate participative processes to identify and agree on outcomes 1.2. Initiate processes to plan, implement and control systems to achieve identified outcomes 1.3. Implement/develop policies and procedures consistent with procedures 1.4. Develop and maintain processes for effective conduct of First Aid responsibilities 1.5. Distribute changes in policy and procedures to relevant personnel using appropriate communication channels 1.6. Undertake review of procedures/policy, and report recommendations as required.
2. Implement effective First Aid training and practice.	2.1. Maintain links with First Aid bodies and professionals and clinical organisations/bodies 2.2. Maintain currency of First Aid and personal qualifications in accordance with industry and organisational requirements 2.3. Review and validate risks against procedures 2.4. Coordinate, plan, implement and evaluate additional training in a timely manner to meet the needs of individuals and the work site 2.5. Ensure practices are consistent with current standards and policies 2.6. Coordinate planning for response to major incidents and make known to the work group in readiness for implementation.
3. Maintain up-to-date professional development of knowledge and skills.	3.1. Undertake self education process in accordance with workplace principles and opportunities 3.2. Access links with various professional First Aid bodies and organisations to maintain currency in the field

ELEMENT	PERFORMANCE CRITERIA
	3.3. Access and communicate promptly relevant information to work group, and maintain certification in accordance with workplace procedures and legislation.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- oral and written communication skills.

Required knowledge

Knowledge and understanding of policy development and systems for human and physical resources sufficient to ensure that First Aid can be effectively and efficiently provided in the workplace. These include:

- national training agenda
- use of referral network
- legal requirements
- duty of care
- State and Territory regulations relating to currency of skills and knowledge.

Knowledge of training and assessment processes and methods.

First Aid principles and 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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a

EVIDENCE GUIDE	
	manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations that will include disruptions to normal, smooth operation. Where applicable, assessment should replicate workplace conditions as far as possible. Where, for reasons of safety, access to equipment and resources and space, assessment takes place away from the workplace, simulations should be used to represent workplace conditions as closely as possible.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence may be demonstrated working individually, under supervision or as part of a First Aid team.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	Competence may be assessed in conjunction with other industry units of competency dealing with things such as: • workplace safety • workplace training • manufacturing practice/competitive manufacturing
Guidance information for assessment	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
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

RANGE STATEMENT	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Systems	Systems may include: • ordering, eg magazines, books • skills updating, eg attending conferences/workshops, reading publications • networking • communication • technological • training and assessment.
Accessing relevant information	Access relevant information may include: • meetings • seminars • log books (personal development) • conferences • alignment with professional First Aid bodies.
First Aid Bodies and Clinical Organisations	First Aid bodies and professional and clinical organisations/bodies could include: • Australian Resuscitation Council (ARC) • International Liaison Committee on Resuscitation (ILCOR) • support groups • registered providers/authorities.
Procedures	Procedures may be from organisations such as: • Australian Resuscitation Council (ARC) • National Health and Medical Research Council • Australian standards • company Standard Operating Procedures (SOPs) • risk management standards • legislation and regulation.
Education	Self education processes may include: • attendance at relevant seminars and conferences • maintenance of professional library • membership of other First Aid bodies • formal training • supervised or unsupervised practice to maintain currency of

RANGE STATEMENT	
	competence.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	HSE

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOHS502B Contribute to safety case

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the skills and knowledge that are required to contribute to the preparation and presenting of a safety case in accordance with the OHS legislation. The safety case must specify the safety management system followed or to be followed in relation to all hazards in a major hazard facility. The worker is expected to work as part of the team that is made up of senior management, engineers, technical and safety specialists.

Application of the Unit

Application of the unit	This unit of competency describes the requirements applicable for those with responsibilities for preparing and presenting a safety case within the enterprise. This may be as a worker or as an owner of a business. The competency is to be exhibited within the area of managerial responsibility, which may be an entire enterprise or department of an enterprise. Roles and responsibilities will vary from enterprise to enterprise.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify and verify issues for presentation.	1.1.Consult with the senior management as well as all relevant departments in a collaborative and objective manner 1.2.Identify and verify issues that are required for the presentation 1.3.Refer to the relevant legislation, and if necessary, clarify requirements from the relevant government departments.
2. Interpret data collected.	2.1.Interpret and analyse data collected 2.2.Use appropriate database for the enterprise to assist in the analysis 2.3.Prepare and distribute analysis and discuss with relevant personnel within the enterprise.
3. Write up a safety case as part of the safety case team.	3.1.Consolidate findings and obtain agreements from relevant personnel as to the information to be included in the case 3.2.Refer to regulatory and format requirements that are stipulated by the authority.
4. Prepare the safety case.	4.1.Prepare the case for submission in accordance with required procedures 4.2.Follow up with the relevant contact in the authority 4.3.Report response from the authority in accordance with enterprise procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
• identification of hazards that can potentially cause an incident in the workplace. • use of consultation processes.
Required knowledge
Knowledge and understanding of all relevant workplace systems sufficient to prepare and present relevant data relating to a safety case. Knowledge of relevant acts or regulations specific to the State or Territory (eg the Victorian Gas Safety (Safety Case) Regulations 1999) in which the relevant facility(s) is located, workplace OHS procedures and other safety management systems and procedures. Management of risks using the hierarchy of control (the preferred order of risk control measures from most to least preferred), that is: • elimination • substitution • isolation • engineering controls • administrative controls • use of personal protective equipment. Hazard analysis (eg HAZOP) and hazard control methodology.

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with

EVIDENCE GUIDE

	the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that the workplace OHS system and State OHS Acts and regulations be understood and that the importance of critical procedures is known. Competence must be demonstrated in the ability to recognise and analyse potential information and then in preparing appropriate data. Consistent performance should be demonstrated. In particular look to see if there is a working knowledge of all relevant workplace procedures. Look for knowledge and understanding in relation to: consultation processes, either general or specific to OHS training and assignment of staff to safety critical work, hazard identification, risk assessment and risk control measures • the need for specific hazard policies and procedures such as housekeeping and inspections • new and relevant OHS information • incident record keeping • maintenance of plant and equipment • purchasing of supplies and equipment. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These

EVIDENCE GUIDE	
	assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency covers process manufacturing plants, which may involve working with machinery, equipment, operational procedures, products or materials that require the preparation of a safety case as prescribed by the relevant regulations.
Safety Management	The safety management system for a facility must, where relevant,

RANGE STATEMENT	
System Requirements	specify: - the critical equipment (including process equipment, machinery, electrical and instrumentation systems) that relate to or may effect the safety of the facility - the systems in place to ensure that the equipment is fit for the purpose: - for which it is used in normal operating conditions - to the extent that it is intended to function or be used in an emergency.
Policies and procedures	Enterprise policies and procedures include those that directly or indirectly cover issues relating to incidents, such as: - hazard policies and procedures - standard operating procedures - safety procedures - work instructions - emergency, fire and accident procedures - personal protective clothing and equipment procedures.
Participative arrangements	Participative arrangements for safety management system may involve: - following OHS procedures - information sessions on existing or new issues - meetings between employer and employees or representatives - access to relevant workplace information - use of clear and understandable language.
Safety Case	The safety case includes information regarding: - person responsible for operation of the facility - person responsible for the safety case - a description of the facility - formal safety assessment of the facility - the safety management system - reporting of incidents - address where records are kept - safety policy - organisational structure and responsibilities - published technical standards applied to or used - the design, construction, installation, operation and maintenance of the facility, and any modifications to the facility - the control system to be used for the facility - the type of machinery and equipment used at the facility

RANGE STATEMENT	
	- the permit to work system - the emergency response plan in relation to incidents - the emergency communication system - the key performance indicators - the system for incident recording, investigation and reviewing training.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	HSE

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOHS511A Manage emergency incidents

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario the person in charge of a facility undertakes the management, coordination and response to emergency situations within the facility. <i>Note: This unit was formerly PMAOHS410 but has been raised to a higher level given the responsibilities of the role</i>

Application of the Unit

Application of the unit	Typical facilities could include: • onshore/offshore installation/rig • floating hydrocarbons production vessel • onshore hydrocarbons production, processing and/or storage facilities • pipeline and related facilities • chemicals manufacturing plant. The person would: • assess the magnitude and impact of the emergency • gather and coordinate all of the necessary emergency response personnel and equipment and direct their implementation • initiate all of the necessary communication responses, both within and outside the facility • manage and coordinate the emergency response. This unit of competency applies to persons who would normally be in control or command of the facility or be required to deputise in this role. They may be expected to be capable of performing all parts of this unit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	<i>PMAOMIR320B</i>	<i>Manage incident response information</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Collect and assess emergency information	1.1. Ascertain the scope and severity of the emergency as quickly as possible, from information received from alarms, personnel and other means 1.2. Collate and assess information on emergency 1.3. Develop appropriate responses to the information received based on emergency response planning.
2. Implement emergency response strategies	2.1. Develop, or promptly implement, onsite strategies in order to combat the emergency 2.2. Monitor continuously information flows relating to the emergency in order to evaluate the effectiveness of the implemented strategy 2.3. Coordinate team activities and resource allocation and direct them to meet the identified emergency 2.4. Delegate authority to appropriate personnel as the situation

ELEMENT	PERFORMANCE CRITERIA
	warrants.
3. Liaise with emergency control	3.1. Collate and communicate information relating to the emergency to emergency control centre 3.2. Request external assistance as appropriate 3.3. Coordinate/incorporate external assistance into emergency response 3.4. Control internal and external communication in accordance with the emergency response plan.
4. Coordinate emergency responses	4.1. Convey feedback relating to progress/status of the emergency to emergency response teams and other personnel 4.2. Regularly reassess and modify responses and tactics in accordance with the status of the emergency. 4.3. Conduct periodic 'time outs' to enable situation updates and proactive directing of resources and actions.
5. Assess emergency response/actions	5.1. Collate and assess information on status of the emergency to enable a final decision to be made and communicated to declare the end of the emergency, or abandonment of the facility 5.2. Consider future stages of the emergency and develop mitigation strategies in advance of those events.
6. Undertake post-emergency evaluation	6.1. Undertake a post-response evaluation of the emergency in order to determine the effectiveness of the response strategies and the emergency response plan 6.2. Recommend and communicate modification and adjustments to the emergency response plans to appropriate personnel 6.3. Review and modify planning of emergency response exercises and training in light of the outcomes of the emergency response evaluation.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

A person undertaking this competency must be able to demonstrate:

- advanced leadership skills

REQUIRED SKILLS AND KNOWLEDGE

- advanced organisation skills
- high level planning skills
- advanced team management skills
- high level hazard awareness and safety awareness skills
- high level communication skills
- ability to work under extreme pressure.

Required knowledge

Demonstrated knowledge of the following:

- use and selection of personal protection equipment
- fire control and attack techniques and strategies
- fire and product leak control and containment techniques and strategies
- characteristics of the plant, equipment and facility and associated facilities emergency situations
- selection and application of appropriate fire extinguishing media
- characteristics of fires and fuel types
- principles and procedures of SCBA
- self rescue techniques
- search and rescue techniques (other than self)
- casualty handling techniques
- relevant facility fire management and safety systems
- emergency communication systems
- emergency response plans
- teamwork principles and techniques
- command and control principles and techniques.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

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	Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role-plays. Simulations of the operation and control of emergency resources, tools and equipment must be made using resources available in the facility. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate mitigating action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • the situation is rapidly assessed and all information available processed quickly • communication of the status and requirements are made to the relevant parties • resources are coordinated in an effective manner • full use of available internal and external resources is made. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range

EVIDENCE GUIDE	
	of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>PMAOMIR444B Develop incident containment tactics.</i>
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Site specific response plans must be adhered to. Systems and resources include: • emergency repair equipment and tools, including pipeline repair equipment • emergency response systems • emergency communication systems • work management systems • installation facility and operational layout • Safety Case or Hazard Control Plan management systems.

RANGE STATEMENT

	External services and third parties may include: • fire brigade • police • ambulance • air traffic control • emergency services • relevant State or Federal government agency • local councils • shippers and customers • medical establishments • consortium partners • national or international medivac services. Environmental legislative requirements must be adhered to.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR210B Control evacuation to muster point

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competence applies to a person who is required to control the evacuation of personnel from the workplace to a muster point and includes moving mobility/sensory impaired people including persons with either temporary or permanent sensory impairment and casualties, or others who require assistance during an evacuation.

Application of the Unit

Application of the unit	Contributing circumstances might include: • fire or smoke spread • hazardous releases - loss of containment • earthquakes, severe storm damage, cyclones, floods and other nature and human-made disasters. The individual would: • control the evacuation • conduct head counts • instigate checks for missing persons • relocate evacuated persons to other areas Generally the person would be part of a team during the incident but may be required to act independently. At all times they would be liaising and cooperating with other members of the team. This unit incorporates features from 145/01 React safely in emergency situations (level one), 145/06 Safeguard endangered persons (level three), 145/11 Coordinate actions to safeguard endangered persons (level four).

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to evacuate	1.1. Recognise alarm or other signs of incident 1.2. Determine nature and location of incident, wind direction and other relevant information 1.3. Assess incident situation and instigate relevant procedure 1.4. Predict probable changes/escalation to incident 1.5. Prepare the area and personnel for evacuation 1.6. Facilitate incident roles and the operation of incident response stations according to procedures 1.7. Coordinate incident response actions according to procedures 1.8. Maintain communication channels with relevant personnel
2. Control evacuation	2.1. Identify hazards associated with evacuation 2.2. Identify and communicate most appropriate path for evacuation to the desired muster point 2.3. Implement relevant hazard control procedures 2.4. Initiate evacuation when appropriate 2.5. Ensure evacuation of mobility/sensory-impaired people

ELEMENT	PERFORMANCE CRITERIA
	2.6. Control incident evacuation according to procedures 2.7. Undertake roll call of evacuated persons 2.8. Communicate required details of evacuation to relevant personnel.
3. Complete evacuation.	3.1. Arrange and coordinate the first aid, welfare and other needs of evacuated persons 3.2. Maintain control over evacuees 3.3. Arrange for/provide assistance to the incident controller as required 3.4. Maintain communication channels with relevant personnel 3.5. Move evacuees to a new location, or dismiss and return to work as appropriate 3.6. Debrief evacuees and seek possible improvements 3.7. Complete all required records and reporting 3.8. Arrange for suggested improvements to be incorporated into procedures as appropriate

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of hazards within the incident response system and to be able to distinguish between causes of hazards indicated by:

- misunderstandings concerning coordination and communication methods
- failure to liaise with emergency services
- lack of timeliness in reporting unsatisfactory outcomes
- failure to carefully check evacuated areas
- incident assessment, response and coordination
- inability to apply incident procedures.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- incident response reports or signals
- hazards and precautions to be taken during incidents
- actions to take in response to developing situations

REQUIRED SKILLS AND KNOWLEDGE

- accounting procedures and analysis of reports from evacuation areas
- miscellaneous incident activities.

Evidence Guide**EVIDENCE GUIDE**

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include 'walk-throughs' of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.

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

Competence must be demonstrated in the ability to correctly respond to incident situations and in implementing appropriate action. The emphasis should be on the ability to stay ahead of the problem rather than to have to take drastic action in order to recover the situation. In particular look to see that:

- incident responses are in accordance with company procedures
- correct incident response equipment (where required) is used appropriately

EVIDENCE GUIDE	
	- the safety and/or successful recovery of the individual and others affected by the incident response is afforded priority in the actions taken - actions taken do not inhibit incident response effectiveness or further contribute to the incident - appropriate documentation including reports, journal entries, logs and/or clearances are completed in accordance with procedures These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all workplace environments it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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
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

RANGE STATEMENT	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and workplace operations which form part of the incident response system which is relevant to evacuations. For your work environment this may include (select relevant items): • hard hats • armbands • torches • smoke hoods • lifejackets • incident communications equipment • check lists and floor plans. Typical hazards for your work environment may include: • spread of fire • threat to adjoining areas • danger of explosion • loss of communications • falling or shifting debris • obstruction of evacuation routes.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR301B Undertake initial rescue

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competence applies to a person who is required to effect an initial rescue arising from an incident on or off-shore. It could apply to any person operating as a team member in a facility and may involve a confined space. This person might typically respond to an incident team leader once the incident is declared.

Application of the Unit

Application of the unit	In a typical scenario, a person undertaking a task in a workplace may witness an incident involving a co-worker, or may be alerted to a difficulty involving a co-worker. In these few initial critical minutes before other help arrives, the actions of the person may have a significant effect on the wellbeing of their co-worker. At no time however should the person take any action which is likely to cause them to be equally placed at risk. Key aspects of the competence include: • making the correct decisions concerning the initial actions to be taken • taking the correct actions in the right sequence • utilising all the available recourses • obtaining the necessary assistance The person may: • evaluate the situation before taking any action • use appropriate methods to assist the person to be rescued • raise the alarm and alert others • use the correct equipment in effecting the rescue This person may be operating under a permit to work but would immediately contact other members of the team, other teams, management and possibly external emergency services as the circumstances and procedures allow. <i>Note:</i> This competency does not cover the requirements to undertake

	comprehensive vertical, technical or confined space rescue, each of which may require the possession of: • <i>PUASAR004A Undertake vertical rescue</i> • <i>PUASAR003A Undertake technical rescue</i> • <i>PUASAR005A Undertake confined space rescue</i> as described in the Public Safety Training Package PUA00.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
	<i>MSAPMOHS216A</i>	<i>Operate breathing apparatus</i>
	<i>MSAPMPER205B</i>	<i>Enter confined space</i>
	<i>MSAPMOHS220A</i>	<i>Provide initial First Aid response</i>
	<i>MSAPMOHS217A</i>	<i>Gas test atmospheres</i>
	<i>MSAPMPER200B</i>	<i>Work in accordance with an issued permit</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Respond to the incident surroundings	1.1. Check the surroundings for signs of any hazards 1.2. Ascertain the condition of the person by visual and auditory means 1.3. Check that the person is wearing any prescribed PPE or harnesses 1.4. Test the atmosphere for safe, breathable air 1.5. Raise the alarm or alert other team members to the situation
2. Determine the condition of the person	2.1. Communicate with the person to check on their condition if possible 2.2. Check the ability of the person to move unassisted 2.3. Gain access to the person providing using appropriate techniques if safe to do so 2.4. Check the person's condition and vital signs and the extent of any injuries 2.5. Determine whether the person can be moved and any obstacles that may need to be overcome
3. Determine the appropriate rescue method	3.1. Consider the condition of the person to be rescued 3.2. Consider the time since the occurrence of the incident 3.3. Consider the options for rescue and choose that most suitable for a single person rescue 3.4. Discontinue rescue efforts if it is evident that the rescue is beyond the your current capabilities 3.5. Make the person as comfortable as possible 3.6. Seek the assistance of rescue or emergency team members <i>Note: If rescue efforts are discontinued go to Element 5</i>
4. Use specialised rescue equipment	4.1. Select the appropriate rescue equipment compatible to the rescue method 4.2. Use rescue equipment to effect a rescue in accordance with manufacturer specifications and organisational procedures
5. Convey information to others	5.1. Frequently and critically monitor the person during the rescue attempt 5.2. Convey information concerning the affected person to arriving team members 5.3. Convey information concerning the surrounding environment to team members

ELEMENT	PERFORMANCE CRITERIA
	5.4. Communicate with emergency team leader and advise progress of rescue
6. Effect rescue if within your capabilities	6.1. Consider local circumstances and effect rescue in the light of those circumstances 6.2. Use appropriate methods to remove person from incident location 6.3. Monitor the condition of the person once removed from immediate danger or incident area 6.4. Continue to communicate the need to obtain assistance in the event assistance has not arrived 6.5. Assist person affected by the incident to acquire necessary medical or other attention 6.6. Hand person over to appropriate individual for further attention
7. Complete incident reports	7.1. Provide a verbal briefing to incident manager giving any details of injuries or ongoing unsafe conditions 7.2. Complete incident report in accordance with organisational procedures 7.3. Report any injuries or trauma effecting self and seek appropriate support 7.4. Suggest any measures to control the risks in the incident area in accordance with procedures and duty of care.
8. Recommend improvements to the rescue process	8.1. Identify possible problems in rescue equipment or process 8.2. Identify problems needing action 8.3. Identify possible causes 8.4. Recommend appropriate solutions within area of responsibility 8.5. Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Competence includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- inability to call for assistance at the incident scene
- non-functional or non-responding safety equipment
- non-functional or non-responding rescue equipment.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- essential First Aid practices
- safe working practices related to the type of plant and equipment being worked on
- essential rescue principles and techniques
- basic rescue equipment types and uses
- obligations and implications of the organisation's work permit system
- PPE and special purpose safety devices such as safety harnesses required for the task being undertaken
- emergency communications systems, their location and operation.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

EVIDENCE GUIDE	
	This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident. Consistent performance should be demonstrated. In particular look to see that: • incident responses are in accordance with prescribed company procedures • correct incident response equipment (where required) is used appropriately • the safety and/or successful recovery of the individual and others affected by the incident response is afforded priority in the actions taken • actions taken do not inhibit incident response effectiveness or further contribute to the incident • appropriate documentation including reports, journal entries, logs and/or clearances are completed in accordance with procedures These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

EVIDENCE GUIDE	
Method of assessment	In all environments it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and workplace activity which forms part of the incident response system. For your work environment this may include (select relevant items): • atmosphere testing equipment • ladders • lifting tackle • slings and harnesses • tripods • stretchers • other equipment integral to the rescue operation. Typical problems for your facility may include: • unsafe working conditions • faulty or defective equipment • lack of appropriate safety equipment on hand • inappropriate work procedures • lack of attention.
Health, safety	All operations to which this unit applies are subject to stringent health,

RANGE STATEMENT**and
environment
(HSE)**

safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMAOMIR302B Respond to a helideck incident

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit applies to people operating in support of helicopter operations at a remote location or specialised helideck landing facility. In the event of an incident the person would undertake a front line role in rescue operations and damage control.

Application of the Unit

Application of the unit	In a typical scenario, a person would facilitate the safe loading and unloading of personnel and cargo prior to or at the conclusion of a helicopter operation. With the occurrence of an emergency landing or aborted take-off the person would provide essential rescue and containment services. Key aspects of the competence include: • making correct judgements about the course of action to be followed • focusing on the rescue and subsequent safety of personnel involved • reducing the hazards applicable to the site • containment or neutralising of any hazardous substances. The individual may: • look for and rescue casualties • contain any fire or neutralise any hazardous substances • render the incident site safe following the incident Generally the person would undertake initial actions of their own accord as an incident team member, however during an incident response they would respond to the incident team leader. At all times they would be cooperating with other members of the incident response team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Respond to the incident	1.1. Raise the alarm 1.2. Identify hazards and personal injury risks associated with the incident 1.3. Take immediate action to initiate deluge system to provide for fire suppression if appropriate 1.4. Ensure blades and rotors have stopped moving before approaching the aircraft 1.5. Look for signs of movement in the aircraft and actions to initiate escape from the fuselage 1.6. Identify the safest path to and from the aircraft
2. Evacuate persons from the aircraft	2.1. Select equipment to facilitate evacuation and rescue 2.2. Act to assist persons trying to exit the aircraft 2.3. Direct or assist persons to a safe area in accordance with the emergency response plan 2.4. Use appropriate rescue techniques and equipment to release entrapped persons

ELEMENT	PERFORMANCE CRITERIA
	2.5. Assist rescued persons to the safe area
3. Provide assistance to evacuees	3.1. Ensure assistance is sought for evacuees 3.2. Assist to extinguish any burning clothing or equipment such as damaged life jackets 3.3. Assist to move evacuees as directed by the incident team leader or medical officer
4. Conclude incident activities	4.1. Assist team members to contain any fires or spillage 4.2. Search for and alert the incident team leader of any collateral damage 4.3. Assist with recovery of any debris that poses a threat to safety, moving components as little as possible in the process 4.4. Seek personal medical attention or support as necessary 4.5. Assist to secure the site to facilitate investigation of the circumstances surrounding the incident
5. Complete incident debrief	5.1. Record any damage inflicted on the aircraft in rescuing personnel 5.2. Complete an incident report in accordance with organisational procedures 5.3. Participate in debriefing sessions conducted by the organisation's or external authority representatives 5.4. Identify any problems in equipment or process of responding to the incident

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- defective or inoperable equipment
- inappropriate or confused response to the incident
- injury to helideck operator.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

REQUIRED SKILLS AND KNOWLEDGE

- type of aircraft and its construction
- aircraft hazards
- helideck emergency procedures
- fire-fighting strategies and tactics for aircraft incidents
- muster points and safe areas for evacuees.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the

EVIDENCE GUIDE	
	incident. Consistent performance should be demonstrated. In particular look to see that: • incident responses are in accordance with prescribed company procedures • correct incident response equipment (where required) is used appropriately • the safety and/or successful recovery of the individual and others affected by the incident response is afforded priority in the actions taken • actions taken do not inhibit incident response effectiveness or further contribute to the incident • appropriate documentation, including reports, journal entries, logs and/or clearances, are completed in accordance with procedures These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions. In all environments it may be appropriate to assess this unit concurrently with other relevant units.
Method of assessment	In all environments it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and workplace activity which forms part of the incident response system. For your work environment this may include (select relevant items): • rescue equipment • specialised tools for cabin entry • fixed fire-fighting systems • deluge systems • portable fire extinguishers • personal protective equipment. Typical problems for your facility might include: • limited space in which to operate • moving parts beyond the proximity of the helicopter fuselage • flying debris • heat • limited vision due to smoke.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure

RANGE STATEMENT

	compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR305A Operate panel during an emergency

Modification History

Release 1 - New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate the panel during a declared emergency.

Application of the Unit

This unit applies to an individual working as part of a team or group and working in liaison with other shift and emergency response team members as appropriate. They would be responding to the incident coordinator/manager.

This unit does not cover routine panel operations which is covered by:

- PMAOPS305B Operate process control systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

PMAOPS305B Operate process control systems

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	Assess a potential emergency	1.1	Identify emergency alarm
		1.2	Clarify cause of the alarm
		1.3	Prepare for response to emergency
		1.4	Escalate to emergency response, as required
		1.5	Report the critical situation, as required
		1.6	Return to normal operations, as appropriate
2	Respond to emergency according to procedures	2.1	Activate all relevant alarms
		2.2	Communicate as required to relevant personnel
		2.3	Check status of all relevant plant and take appropriate action
		2.4	Maintain a record of critical information, as required
		2.5	Shut down plant items, as appropriate
3	Monitor emergency	3.1	Monitor any escalation of the emergency
		3.2	Monitor critical variables of relevant plant
		3.3	Monitor weather and other external conditions
		3.4	Clarify and act on information received
		3.5	Make changes as requested by incident commander
		3.6	Continue to operate any parts of the plant which are still online
		3.7	Communicate as required to relevant personnel
4	Conclude emergency	4.1	Sound all clear when instructed
		4.2	Confirm plant systems which are able to be operated

response	4.3	Bring operational plant back to best available operating conditions
	4.4	Review procedures and training
	4.5	Review emergency response

Required Skills and Knowledge

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

Required skills

Required skills include:

- operating the distributed control system (DCS)
- communicating effectively under stress
- reacting appropriately under stress
- analytical skills
- monitoring the situation and minimising risks to personnel, plant and environment
- working safely in accordance with operational requirements and safe systems of work

Required knowledge

Required knowledge includes:

- organisational procedures
- emergency response structures
- accessing and interpreting weather conditions
- alarms, causes of alarms and false alarms
- indicators of developing and existing critical situations
- actions appropriate to control emergency situations
- reporting procedures
- emergency response communication systems, personnel and procedures

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

Critical aspects for assessment and evidence are:

- a potential emergency is assessed
- an emergency is responded to using the panel
- an emergency is monitored using the panel.

Context of and specific resources for assessment

Assessment will require access to an accurately simulated environment in the absence of an on-site incident environment, or a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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.

Context

This unit of competency includes declared situations or emergency conditions in the plant or process where it has escalated to an emergency.

Incident commander

Incident commander is the person who has the responsibility to take charge of the response to the incident. The control room operator, and all other roles, act under the direction of the designated incident commander in a declared emergency incident. While this role may be delegated to another, responsibility for the correct operation of the control room and its operators remains with the commander.

Procedures

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to resolve to designated person

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector(s) Support/generic

Competency field

Custom Content Section

Not applicable.

PMAOMIR317B Facilitate search and rescue operations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the competency to establish local support for interaction between an isolated facility and appropriate agencies, initiation of a muster, development of advice to assist the search and rescue, provide details of local weather, contact the search controller and activate incident response system.

Application of the Unit

Application of the unit	This person would typically respond to an incident coordinator. The search and rescue operation may arise from an incident over land or sea. Such incidents could involve aircraft or vessels or, in some cases, land searches. Generally the person would be a senior technician, team leader or a manager and would need to liaise with all relevant internal and external personnel during the search and rescue.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Establish a search and rescue support plan related to the facility	1.1. Identify possible search and rescue scenarios in liaison with relevant personnel 1.2. Identify relevant local (or other) agencies 1.3. Identify key contacts with relevant agencies 1.4. Liaise with relevant agencies to develop/review site/agency interaction plan(s) for a search and rescue 1.5. Assess plan(s) for operability and practicality 1.6. Assess proposed plans with relevant agencies for compatibility with each other and own systems 1.7. Negotiate and resolve conflicts 1.8. Ensure site emergency plans are consistent with agreed agency interaction plans.
2. Activate search and rescue support plan	2.1. Recognise that a search and rescue is required 2.2. Obtain information required by the procedures and determine relevant agency/agencies to contact 2.3. Contact relevant agency/agencies and activate search and rescue 2.4. Provide all relevant and available information to the agency 2.5. Activate site incident response system relevant to the incident.
3. Liaise with search and rescue agency/agencies	3.1. Monitor local situation and advise agency of any relevant changes 3.2. Monitor search and rescue progress and provide relevant information to site incident response team 3.3. Advise relevant personnel in own organisation of progress

ELEMENT	PERFORMANCE CRITERIA
	3.4.Negotiate issues with agency/agencies and own organisation 3.5.Determine the need for additional/different resources and negotiate their timely acquisition 3.6.Identify problems/potential problems with the search and rescue and develop solutions in liaison with the agency/agencies and own organisation.
4. Conclude search and rescue support	4.1.Negotiate a conclusion to the search and rescue with the agency/agencies and own organisation 4.2.Collect and preserve all relevant information 4.3.Debrief with relevant people involved 4.4.Complete reports as required 4.5.Identify items for improvement and take action to have improvements implemented/built into support plans.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
Competence includes an understanding of search and rescue techniques and the capability of relevant search and rescue agencies and platforms and the ability to recognise and resolve problems. In particular it includes and ability to: • negotiate with relevant agencies • access and collate information and determine information relevant to the search and rescue • interpret the search and rescue plans for different agencies and determine interfaces with own organisation/site/facility • keep required records before, during and after a search and rescue incident • effectively communicate and consult with a range of individuals by a range of means, including fax, telephone and face-to-face.
Required knowledge
Competence includes knowledge of: • relevant communication systems • organisational search and rescue procedures

REQUIRED SKILLS AND KNOWLEDGE

- external support agencies and their roles
- types and limitations of rescue vessels, aircraft or motor vehicles
- local weather conditions
- response times
- available local resources.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation (eg Search and Rescue Exercise - SAREX) or under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the

EVIDENCE GUIDE	
	incident. Consistent performance should be demonstrated. In particular look to see that: • communication links with agencies are established • a log of relevant information is routinely maintained • information required is able to be quickly accessed and communicated to relevant agency • different agencies and their capabilities is known. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all facilities it may be appropriate to assess this unit concurrently with other relevant units
Guidance information for assessment	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
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 if the

RANGE STATEMENT	
candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit does not involve the development of search and rescue plans, nor the conduct/coordination of a search and rescue, but rather relates to the site/facility person who will need to provide organisation input to the specialist search and rescue organisations. Rescue scenarios may include: • lost plane/helicopter transporting crew • lost supply vessel • lost truck/vehicle • individual or groups requiring rescue • hazardous or non-hazardous goods • Relevant agencies may include: • national maritime search and rescue • SES • police Information required may include: • last known position • expected route and arrival and departure times • local weather conditions • relevant conditions at site such as landing facilities Conclusion to a search and rescue may be because: • object of search found and rescued • agencies recommend search be called off
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under

RANGE STATEMENT

	the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR320B Manage incident response information

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the managing of information during an incident. This may well apply to all of the information coming into an incident response centre. The person would typically respond to the incident coordinator or incident manager.

Application of the Unit

Application of the unit	In a typical scenario, the person must ensure that information is identified, recorded, analysed and acted upon according to the nature and impact of the information. For instance, the numbers of personnel evacuated from an incident scene, their condition, location and contact details would be accurately collected, recorded and then reported to the incident team. In such a situation the families, media or the authorities may need to be accurately informed in the appropriate way and within an acceptable timeframe. The person may undertake mathematical calculations, critical analysis and problem solving, eg the estimation of the length of time a tank may burn, based on the size and contents of the tank. Key aspects of this competency include: • capturing and retaining all information coming in from the incident • sorting and prioritising of information • analysing and interpreting information for trends and impacts • forwarding key information to those who require it • keeping track of people, activities and follow-up actions • maintaining a chronological record of events for future reference The individual may be: • aware of the information channels available and the information coming in • able to analyse and prioritise information for support of the incident management process • capable of processing the data to project future trends, impacts or

	directions of the incident able to communicate effectively with a wide range of personnel Generally the person would be a team leader, manager or technical specialist and be part of an incident response team during the incident. At all times they would be liaising and cooperating with other members of the team. They may have an ongoing role for managing incident information and/or the incident information system.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify incident information needs and sources	1.1.Determine the information needs of stakeholders 1.2.Identify the sources of required information 1.3.Review information currently held/collected by the

ELEMENT	PERFORMANCE CRITERIA
	organisation to determine suitability and accessibility 1.4. Prepare processes to obtain information that is not available, suitable or accessible within the organisation.
2. Develop/review incident reporting system	2.1. Ensure incident reporting system provides data relevant to the information needs 2.2. Ensure incident reporting procedures reflect required process 2.3. Arrange for training of people as required to use incident reporting system 2.4. Monitor use of incident reporting system and recommend improvements as required.
3. Collect and analyse data	3.1. Collect timely and relevant data 3.2. Ensure data is suitable for analysis, interpretation and dissemination 3.3. Ensure an accurate chronological record of events is maintained 3.4. Analyse data to provide required information.
4. Record and report information.	4.1. Report required information and recommendations as required to all stakeholders 4.2. Store and retrieve data/information in an appropriate format using appropriate technology 4.3. Monitor the performance of the information system and recommend improvements as appropriate.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

A person undertaking this competency must be able to demonstrate:

- well developed writing skills
- ability to identify and accurately record relevant information
- stability under pressure
- well developed communication skills
- analytical skills

REQUIRED SKILLS AND KNOWLEDGE

- ability to differentiate between differing levels of information
- ability to apply basic mathematical processes and obtain correct answers.

Required knowledge

Competence includes an understanding of the information needs of the organisation and the data which may be able to produce it. In particular it includes knowledge of:

- information collection and collation methods
- analysis and display techniques
- information evaluation issues
- information storage requirements and methods
- organisational reporting procedures
- organisational incident response procedures
- emergency response communication systems and procedures
- organisational command and control structures.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal

EVIDENCE GUIDE	
	operations and walk-throughs of abnormal operations) and off the site.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to correctly interpret data and produce the required information. Consistent performance should be demonstrated. In particular look to see that: • all incident data is captured, recorded and available for stakeholders • data is sorted, prioritised and analysed to provide timely updates for stakeholders • reports are produced as required • data is analysed to support the ongoing management of the incident • chronological event recording is maintained for post-incident review These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all workplace environments it may be appropriate to assess this unit concurrently with relevant units.
Guidance information for assessment	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

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.

Codes of practice/ standards

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit of competency includes collection and reporting of all data on incidents.

Stakeholders may include:

- personnel (employees, management on or off the site/plant/facility)
- incident coordination team and incident management team
- employee families
- authorities
- media
- community

Data may include:

- numbers and placement of internal personnel and incident equipment
- numbers and placement of external personnel and equipment
- information on casualties, personal details, location and condition
- quantities, nature and present condition of materials
- arrangement, condition and details of equipment and plant

Reports and reporting methods may include:

- incident information board
- regulatory reports
- media briefings
- information reports to management and workers
- recommendations and follow up reports on changes made

Analysis may include:

- application of statistical methods
- mathematical calculations
- critical analysis
- problem solving

Typical problems may include:

- sorting and prioritising data to seek the critical data

RANGE STATEMENT	
	• difficulties in obtaining reliable data and information • dealing with rumour and unsubstantiated information • working in a stressful environment
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR321B Manage communication systems during an incident

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the management and availability of effective communication systems during an incident. The person would typically respond to the incident coordinator or the incident manager.

Application of the Unit

Application of the unit	In a typical scenario the person may estimate the communication needs and set about to provide them. Depending on the nature of the incident, this may include a wide range of communication processes. It could, for instance, include the provision of a telephone centre to handle media requests, inquiries from families, and secure lines of communication between the incident centre and outside authorities. The likelihood of the communications being disrupted by the incident would need to be planned for and the provision of alternative radio communication equipment and facilities may be required. Key aspects of the competence include: • identifying the stakeholders and their communication needs • provision of the communications systems required • establishing the communication channels to keep the stakeholders linked • being able to prioritise the needs and availability of resources. The individual may be: • able to prioritise and respond to requests and requirements • familiar with communication equipment and systems available • able to work in a stressful environment Generally the individual would be part of an incident team during an emergency situation though may be required to take independent action. At all times they would be liaising and cooperating with the incident manager.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Check existing communications systems	1.1. Check that the available communications systems are operable 1.2. Ensure that personnel are available and trained to use the existing facilities 1.3. Ensure that recording systems are in place to enable accurate recording of data.
2. Provide necessary communications systems	2.1. Identify stakeholders in the incident management process 2.2. Identify the communication needs of these stakeholders 2.3. Plan for the acquisition and deployment of the

ELEMENT	PERFORMANCE CRITERIA
	systems necessary to provide the communication needs 2.4.Acquire, set up and put into operation the communications systems as required 2.5.Allocate and train personnel as required to support the communication systems provided.
3. Prepare contingency plans	3.1.Review the incident information available to estimate possible future communication requirements 3.2.Prepare contingency plans for communication requirements, including all equipment, facilities, resources and people 3.3.Manage the contingency plan to ensure that systems are provided as required 3.4.Review and update the requirements throughout the incident
4. Keep a record of the incident	4.1.Maintain a chronological record of the incident, the needs, resources and solutions as the incident progresses 4.2.Prepare a report, including recommendations for the future, at the conclusion of the incident
5. Control hazards concerned with the communications systems	5.1.Identify hazards in the work environment 5.2.Assess the risks arising from those hazards 5.3.Implement measures to control those risks in line with procedures and duty of care
6. Respond to problems	6.1.Identify possible problems in equipment or process 6.2.Determine which problems need action 6.3.Determine possible fault causes 6.4.Rectify problem(s) using appropriate solution(s) within area of responsibility 6.5.Follow through items initiated until final resolution has occurred 6.6.Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of issues within the incident response system and to be able to distinguish between causes of issues indicated by:

- difficulties in operations and use of communications systems during an incident
- failure of equipment
- lack of suitably trained or specialised personnel.

Required knowledge

Competence includes an understanding of the communication needs of the organisation and the facilities and equipment which may be able to produce it. In particular it includes:

- details of the existing communication systems
- alternative communications systems, their suitability and availability
- contingency planning
- acquisition and provision of communications capability
- reporting procedures of the organisation.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case

EVIDENCE GUIDE	
	studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident. Consistent performance should be demonstrated. In particular look to see that: • key communication channels are identified and maintained • information is supplied to the key personnel involved in the incident • appropriate documentation including reports, journal entries, logs and/or clearances are completed in accordance with procedures. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

EVIDENCE GUIDE**Guidance information for assessment**

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**

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.

Codes of practice/ standards

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit of competency includes all such items of equipment and unit operations which form part of the incident response system. In your facility this may include:

- telephone equipment, including handsets, switchboards, satellites and lines
- mobile phones, fax machines, video conferencing, messaging/paging
- computers, Internet, email
- radio systems (HF, VHF)
- printers, copiers and supplies.

Typical problems for your facility may include:

- damage to existing infrastructure
- availability of equipment and resources
- lack of specialised and/or trained people
- volume of communications being received.

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various

RANGE STATEMENT**Facility
Legislation**

Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR346B Assess and secure an incident site

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit applies to a person who would typically be an incident team leader and who, following an incident, undertakes the inspection of the site and makes an initial assessment as to the immediate safety of the area.

Application of the Unit

Application of the unit	The incident team leader typically responds to the incident coordinator, who may be stationed in the incident control centre. In a typical scenario, following the occurrence of an incident the person would take action to ensure the immediate incident site is safe and take steps to maintain facility safety, record details of the scene and preserve it from contamination. The person may also be required to manage the scene pending the arrival of appropriate authority or company representatives as required by company procedures, legislation or regulations. Incident scenes may be the consequences of: • explosions • loss of containment of hazardous materials • environmental incidents • hydrocarbons fires or releases of noxious or toxic gasses The person would: • ensure that the site is rendered safe and that access to the area is limited • take steps to ensure the site is preserved intact • ensure that site is isolated from ancillary processes to prevent secondary incidents • note or record all pertinent details • take statements or conduct interviews of witnesses Generally the person would be part of a team during an investigation however may be required to take independent action. At all times they would be liaising and cooperating with other members of the organisation's incident

	management team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Secure and preserve the scene	1.1.Undertake an initial assessment of the site to identify factors which will impact on safety and scene preservation 1.2.Ensure that secondary incidents are prevented by isolating the site from associated or ancillary processes 1.3.Coordinate arrangements to secure the incident/accident site to preserve the site and maintain the safety of personnel in line with procedures 1.4.Restrict access to the site until the arrival of authorised company or external authority representatives

ELEMENT	PERFORMANCE CRITERIA
2. Record details of the incident site	2.1. Record details of the scene according to the organisation's policies and procedures 2.2. Note the status of any equipment in the incident area 2.3. Communicate information to relevant personnel in line with the procedures
3. Gather information	3.1. Record witness details and note any information given in accordance with procedures 3.2. Take statements from witnesses and record details of persons believed to be near the site prior to or during the incident 3.3. Develop an initial timeline of events leading up to the incident
4. Ensure safety when responding to an incident	4.1. Identify hazards 4.2. Assess the risks arising from those hazards 4.3. Implement measures to control those risks in line with procedures and duty of care
5. Respond to problems	5.1. Identify possible problems in equipment or process 5.2. Determine which problems need action 5.3. Determine possible fault causes 5.4. Rectify problem(s) using appropriate solution(s) within area of responsibility 5.5. Follow through items initiated until final resolution has occurred 5.6. Report problems outside area of responsibility to designated person

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of issues within the incident response system and to be able to distinguish between causes of issues indicated by:

- materials being moved from the site without approval
- vehicular or personal traffic contaminating the site
- personnel being injured or contaminated on the site

REQUIRED SKILLS AND KNOWLEDGE

- loss of evidence from the site.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- methods of securing the site
- techniques for removing survivors and non-survivors from the area
- organisation requirements for taking witness details and information
- regulatory requirements for taking witness details and information
- legislative and organisation requirements relating to scene preservation
- types of information which may assist in investigations.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.

Critical aspects for assessment and

Competence must be demonstrated in the ability to

EVIDENCE GUIDE	
evidence required to demonstrate competency in this unit	correctly respond to incident situations and in implementing appropriate action. The emphasis should be on the ability to stay ahead of the problem rather than to have to take drastic action in order to recover the situation. Consistent performance should be demonstrated. In particular look to see that: • incident responses are in accordance with company procedures • site is secured to preserve and maintain safety of personnel and restricted access • the safety and/or successful recovery of the person and others affected by the incident response is afforded priority in the actions taken • actions taken do not inhibit incident response effectiveness or further contribute to the incident • appropriate documentation including reports, journal entries, logs and/or clearances are completed in accordance with procedures These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all workplace environments it may be appropriate to assess this unit concurrently with relevant units such as
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the incident response system. In your facility this may include (select relevant items): • note taking materials • standard forms • sketching materials • photographic equipment • taping or electronic videoing equipment • non sparking or radio transmission equipment (where safety permits) Examples of problems that may arise include: • rescue equipment or personnel contaminating the site • inherent site dangers from debris or damaged equipment • weakened structures • difficulties in maintaining communication • explosive atmospheres
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for

RANGE STATEMENT

	appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR407B Audit incident preparedness and established response systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the competency to assess the extent to which a facility is prepared to respond to an incident. This could apply to all of the realistically potential incidents which might occur to an organization, including those under its safety case. The person undertaking the audit would typically respond to the incident manager.

Application of the Unit

Application of the unit	In a typical scenario the person would undertake an analysis of existing incident preparedness and response systems as part of a continuous improvement process or spot check. Part of the audit may involve the conducting of an unscheduled incident response drill, analysing the results and providing a thorough debrief of the persons involved. The person then may make recommendations for changes to the system Key aspects of the competency include: • thorough examination of each of the various systems in place • identifying key areas where systems overlap or system breakdowns occur • ensuring that the established systems are working in accordance to the incident response plan and legislative requirements The person may: • communicate extensively within and outside the organisation • review and audit practices and processes relevant to incident response • identify and as necessary reinforce system benchmarks • provide input towards system continuous enhancement. • conduct and assess incident exercises as required. Generally the person would be an incident coordinator, manager or technical specialist and be part of an incident response team during the incident. They may have an ongoing role for managing incident information and/or the

	incident information system.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Benchmarks for audit are clearly identified	1.1. Access, interpret and clarify the legislative, statutory and site requirements relating incident preparedness and response systems 1.2. Access and review relevant documentations of the plan and established management systems 1.3. Conduct consultations with stakeholders and specialist as necessary
2. Plan, organise and undertake audit of the established incident	2.1. Identify or develop methods to audit the established management systems and processes as prescribed by the plan and/or legislation in consultation with relevant

ELEMENT	PERFORMANCE CRITERIA
response systems	personnel 2.2. Identify and secure the resources required to conduct the audit 2.3. Gather and sight relevant documents and all other evidence required in accordance with procedures 2.4. Conduct the audit according to prescribed/pre-agreed methodology and in a manner that enhances the organisation's confidence and commitment to the incident response system
3. Evaluate and report the results of the audit	3.1. Evaluate evidence gathered for reliability, validity, authenticity, sufficiency, currency and consistency 3.2. Promptly bring to the attention of relevant personnel any findings which have serious or immediate risks 3.3. Disseminate records of the process and outcomes of the audit, including justifiable recommendations complying with procedures, to appropriate personnel in a timely manner
4. Follow up results of the audit	4.1. Discuss and confirm results with relevant personnel and provide feedback including advice on corrective actions 4.2. Follow up corrective actions relating to deficiencies until resolution has been achieved

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- audit methods fail to provide sufficient qualitative and quantitative data
- audits fail to identify key system failures
- actions arising from audits do not translate into improvements in the system
- relationships between incident response partner organisations do not function as intended.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

REQUIRED SKILLS AND KNOWLEDGE

- relevant legislation
- relevant company policy management systems/procedures relating to incident preparedness and response
- company requirements in relation to audit and review procedures
- hazard identification and control
- OHS requirements
- risk management principles and techniques
- incident containment tactics.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.

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

Consistent performance should be demonstrated. In particular look to see that competence in this unit reflects successful assessment in the critical aspects of:

EVIDENCE GUIDE	
	• safe conduct of audit and review • identification of benchmarks for audit and review • development of methodologies for effective audit and review • compliance with prescribed methodologies for audit and review • evaluation of documents and evidence • demonstrated understanding of the value of accuracy, attention to detail and impartiality • information gathering, analysis and communication These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.
Method of assessment	It may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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
The Range Statement relates to the unit of competency as a whole. It allows for different work

RANGE STATEMENT	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Management systems include (but are not limited to): • evacuation • emergency operations structure • communications • information management • documentation and reporting requirements • resource management • training • audit and review system • financial management Documents and evidence may include: • electronic databases • videos • photographs • written information/records • training and learning programs
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR418B Coordinate incident response

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the coordination of the response to off-shore or on-shore incidents. The person may be the incident coordinator, or could be a member of the incident control centre team. The incident coordinator typically responds to the incident manager, who may be stationed away from the facility or plant.

Application of the Unit

Application of the unit	In a typical scenario, the person is in charge of an incident control centre on or near the facility. The incident coordinator is responsible for interactions between corporate headquarters, the on site incident response teams and the person in charge of the facility. There may be more than one incident response team involved depending on the size and complexity of the incident. Key aspects of the competence include: • minimising the escalation of the incident • allocation of resources and assets • tactical response planning, consistent with the philosophies and strategies of the organisation • close communication with the incident response team(s) • interactions with external agencies required to assist with the emergency • gathering information concerning the incident The individual may: • effectively communicate and consult with a range of individuals and organisations • develop incident response and/or incident search and rescue tactics based on information available • negotiate and communicate with internal support structures set up to assist with logistics planning, operations and external affairs Generally the individual would assume command of the incident response team(s) during an incident response though may be required to take advice from the incident support management group. At all times they would be

	liaising and cooperating with members of the incident support management group.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Assess the situation and determine priorities	1.1. Seek incident information from appropriate on-site personnel 1.2. Monitor changes in the nature, extent and potential implications of the incident 1.3. Develop an incident response tactics based on analysis of the situation and consistent with the philosophies and strategies of the organisation 1.4. Identify required resources in accordance with the tactics developed

ELEMENT	PERFORMANCE CRITERIA
	1.5. Continually review objectives in light of information updates, reports and feedback
2. Manage incident control centre	2.1. Brief incident control centre personnel on the scenario and tactics, their roles and responsibilities and of the way the centre will operate 2.2. Allocate tasks to incident control centre personnel commensurate with their roles and level of competence 2.3. Monitor performance of incident control centre personnel and review as the incident unfolds to determine ongoing requirements
3. Liaise with internal management and support structures	3.1. Regularly brief and provide communications to appropriate personnel in accordance with procedures 3.2. Monitor and review resources to determine changing requirements in accordance with changing circumstances 3.3. Ensure resources are available as required 3.4. Provide or obtain guidance and support to/from management and support structures.
4. Ensure communications systems are effective	4.1. Establish communications with personnel at the incident scene 4.2. Establish communications with other personnel on or off-site as required 4.3. Ensure communications systems are managed to provide optimum capability.
5. Conclude and review incident activities	5.1. Account for all personnel and other resources 5.2. Conduct a debrief and complete company incident reports 5.3. Evaluate and review tactics and procedures 5.4. Evaluate and document effectiveness of the control function and its interaction with command organisations 5.5. Communicate reports in accordance with company procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

REQUIRED SKILLS AND KNOWLEDGE

Required skills

Competence includes the ability to isolate the causes of issues within the incident response system and to be able to distinguish between causes of issues indicated by:

- incorrectly determining the range and performance of resources required to address the incident
- inappropriate resources being assigned to the incident response operation
- failure of communications systems within the command post
- overestimating the capabilities and competence levels of personnel.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- incident management techniques
- operational duration of essential equipment
- legislative and regulatory requirements
- coaching and team building concepts
- the organisation's policies and procedures protocols
- how to communicate effectively under stress.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency

EVIDENCE GUIDE

	components and may include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident. Consistent performance should be demonstrated. In particular look to see that: • incident responses are in accordance with company procedures • correct incident response equipment (where required) is used appropriately • the safety and/or successful recovery of personnel and others affected by the incident response is afforded priority in the actions taken • actions taken do not inhibit incident response effectiveness or further contribute to the incident • appropriate documentation including reports, journal entries, logs and/or clearances are completed in accordance with procedures These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning

EVIDENCE GUIDE	
	behind the observable actions.
Method of assessment	In all workplace environments it may be appropriate to assess this unit concurrently with relevant PMAOMIR units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency covers incidents that may include: • fire, explosion • loss of containment, eg gas leaks, spills • damage to facilities, eg accidents, crashes, aircraft • natural disasters, eg cyclones, wind, rain, earthquake, flood • other, eg riot, civil unrest, terrorism It includes all such items of equipment and unit operations that form part of the incident response system, and may include: • schematics, designs, detail drawings, maps/charts • data systems, computers systems, electronic aids • manuals, designs, operation procedures and instructions • emergency vehicles or equipment • vessels and aircraft Incident response may include: • search and rescue operations • engagement of emergency services (fire, ambulance, rescue,

RANGE STATEMENT	
	military) - liaison with other agencies (environmental, clean-up, specialised troubleshooters) Typical problems for your facility may include: - communications problems - inappropriate information - confusion over roles and responsibilities - lack of cooperation - inappropriate location of command post in relation to incident
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR424B Develop and maintain community relationships

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the establishment of workable arrangements which engage and inform the community about aspects of the plant's operations and incident response systems. This could apply to information about the products the operation produces, critical events on the organisation's calendar such as incident response practices and means by which the community would be kept informed during an incident.

Application of the Unit

Application of the unit	In a typical scenario the person is a member of the incident room team and is designated with the task of ensuring the preparedness of the communities surrounding and/or affected by the facility to respond to an incident. For example the organisation is preparing to shut down part of the plant for routine maintenance and as part of that process some of the gas will be flared off. This will create a spectacular plume over the plant but because the community is alerted to both timing and what to expect, community panic and concern is limited. Key aspects of the competency include: • gathering and disseminating key information to the community • identifying key organisations in the community with which communication links need to be established • establishing inclusive strategies concerning both routine and non-routine events. This person would: • establish networks within the community • design and conduct public safety awareness activities that will establish community preparedness by enhancing awareness. While independent action may sometimes be required, the person is expected to liaise, cooperate and consult with other members of the incident management team as necessary.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify information that needs to be disseminated to the community	1.1. Access and examine incident response plans 1.2. Conduct consultations with appropriate personnel as necessary
2. Establish networks within the community	2.1. Identify stakeholders within the community 2.2. Initiate contact with key community stakeholders 2.3. Establish and maintain rapport 2.4. Enlist cooperation and support in organising and conducting public safety awareness activities
3. Design and conduct public safety awareness activities	3.1. Develop a plan in consultation with stakeholders and appropriate personnel 3.2. Design activities to support the plan in consultation

ELEMENT	PERFORMANCE CRITERIA
	with stakeholders and appropriate personnel 3.3. Clearly identify measures for assessing the outcome of activities 3.4. Develop and distribute marketing materials and educational materials/resources appropriate to the context, issue and audience 3.5. Identify and secure other resources required 3.6. Develop and implement strategies for delivery of the project to ensure maximum effectiveness 3.7. Make adjustments as required to meet the needs of specific groups
4. Evaluate activities	4.1. Assess activity outcome against the planned goals/objectives and measures 4.2. Complete reports detailing activities, results and recommendations according to procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
Competence includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by: - expressions of community concern about a lack of communication with the organisation - an atmosphere of mistrust existing between the community and the organisation - constant referrals of organisational activities to local, State or Commonwealth authorities - the volume of requests for information received from community groups or individuals - protest meetings or rallies by concerned residents.
Required knowledge
The knowledge referred to in the Evidence Guide for this unit includes: - relevant legislation - incident response plans and management systems (particularly warning signals and evacuation procedures) - promotional techniques and methods - group dynamics

REQUIRED SKILLS AND KNOWLEDGE

- a range of presentation strategies and techniques
- protocols and procedures
- relevant organisational policies.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.

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

Consistent performance should be demonstrated. In particular look to see that competence in this unit reflects successful assessment in the critical aspects of:

- identification of networks critical to the development and implementation of public safety awareness activities
- design, conduct and evaluation of public safety

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	awareness activities • effective communication skills These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.
Method of assessment	It may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Public safety awareness activities may include: • distribution of educational materials/resources • use of media to disseminate information • public educational presentations

RANGE STATEMENT	
	• conduct of or attendance in community meetings/forums • incident exercises Relevant information may include: • incident response plan and management systems in place to prevent an incident • warning signals in the event of an incident • procedures to be followed in the event of an incident relating to evacuation and welfare operations • appropriate people to contact and contact details • post-incident management systems
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite Units		

PMAOMIR430B Conduct and assess incident exercises

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit addresses the competence required to conduct and assess incident exercises. The person would be engaged in the construction of scenarios that approximate incident situations and exercises in dealing with those incidents.

Application of the Unit

Application of the unit	In a typical scenario the person would be a member of the incident room team and would be responsible for ensuring that both scheduled and unscheduled incident exercises took place. Results of these exercises would provide essential input into the audit and evaluation of incident preparedness of the facility. However, a proper post-exercise debrief is critical, as the exercise likewise has a strong educative value that promotes awareness and understanding among participants. Key aspects of the competence include: • establishing key objectives and strategic outcomes from incident exercises • improving the organisation's level of preparedness should an incident occur • improving the ability of personnel to respond appropriately and safely during an incident The person may: • communicate extensively both inside and outside the organisation • establish and support mechanisms for the design and conducting of incident exercises • review and evaluate the soundness of incident response plans and management systems. Generally the person would be an incident coordinator, manager or technical specialist and be part of an incident response team during the incident. They may have an ongoing role for managing the training and incident exercise system.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine objectives	1.1. Identify the need for the incident exercise in consultation with stakeholders 1.2. Determine the objectives of the exercise which meet the identified need
2. Design exercise	2.1. Select the exercise style, consistent with the objectives, in consultation with stakeholders 2.2. Design the exercise to ensure that objectives are met and address health, safety and environment issues 2.3. Identify and secure the resources to support the exercise 2.4. Distribute the exercise plan stating the objectives to appropriate personnel

ELEMENT	PERFORMANCE CRITERIA
3. Manage exercise	3.1. Brief personnel involved in the exercise in respect of aims, objectives, expectations and activity outcomes 3.2. Use the exercise plan to initiate and facilitate the conduct and direction of the exercise 3.3. Conduct the exercise in a manner that addresses health, safety and environment issues 3.4. Monitor the progress of the exercise and provide feedback to personnel
4. Evaluate outcomes	4.1. Plan a post exercise debrief based on the conduct and outcomes of the exercise 4.2. Conduct a debrief with activity personnel 4.3. Review outcomes of the activities against objectives 4.4. Prepare and distribute a report of the activity to stakeholders

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
Competence includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by: • exercises are not conducted according to expectations • unintended or inappropriate exercise outcomes • mismatches between equipment and incident requirements • lack of appropriate feedback at the conclusion of training exercises • an injury occurs during the conducting of the training exercise.
Required knowledge
The knowledge referred to in the Evidence Guide for this unit includes: • legislative and regulatory arrangements relating to incident management • incident response plan and management systems • incident management concepts and principles • adult learning principles • relevant networks • problem solving and decision making techniques • assessment and review techniques

REQUIRED SKILLS AND KNOWLEDGE

- project management principles.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.

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

Consistent performance should be demonstrated. In particular look to see that competence in this unit reflects successful assessment in the critical aspects of:

- clearly identifying the need for the exercise
- planning, conduct and evaluation of exercise
- hazard identification and control
- demonstrated understanding and ability to address health, safety and environment issues
- briefing and debriefing

These assessment activities should include a range of

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	problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.
Method of assessment	It may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Types of exercise may include: • scenario analyses • case studies • role plays • discussion exercises / desktop exercises • functional centre exercises (specific task environments within the workplace)

RANGE STATEMENT

	• field exercises • synthetic training • high level architecture • multimedia • virtual reality • distributed interactive software The design process may include: • determination of activity management structure • development of documentation • design of activity • issuing notifications • briefings and debriefings Activity personnel refers to people who assist in the conduct of the incident exercise and may include: • activity director • directing staff/coordinators/facilitators • safety officers • assessors/umpires • public relations staff • casualty simulators • role player liaison officers • administrative/welfare personnel to support learning and assessment tools Activity documentation may include: • activity notification • activity management checklists • general instructions • safety instructions • timetable/schedule of events, exercise plan • activity inputs
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of

RANGE STATEMENT

Legislation	the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMAOMIR444B Develop incident containment tactics

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the competency required in the development of tactics that are to be used in the containment of incidents in on-shore and off-shore facilities. The person would typically be an incident coordinator who would respond to the incident manager.

Application of the Unit

Application of the unit	In a typical scenario the person must ensure that the tactics proposed to be employed in response to an incident are appropriate to the circumstances and that actions taken in changing circumstances are effective in dealing with the incident. For instance the options available to incident response teams may be limited and include the need to follow specific procedures or sequences of events. In such a situation the organisation may need clearly defined procedures to ensure that all levels of incident response are aware of how the incident is to be confronted. Key aspects of this competency include: • forming clear and unambiguous views about the nature of the potential incident • evaluating and prioritising alternative tactics • analysing and interpreting information for trends and impacts • forwarding key information to those who require it The person may: • undertake critical analysis and problem solving • examine specific scenarios and develop tactics to physically contain those events • evaluate alternative tactics • recommend the most appropriate strategy • document strategies Generally the person would be an incident coordinator, manager or technical specialist and be part of an incident response team during the incident. They may have an ongoing role for managing incident information and/or the incident information system.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify incident containment tactics	1.1. Identify risk characteristics of the possible incident scenarios 1.2. Identify specific objectives of incident containment 1.3. Identify existing tactics 1.4. Develop a range of alternative tactics
2. Evaluate tactics	2.1. Predict incident behaviour and growth under alternative strategy scenarios 2.2. Consider issues relating to health, safety and environment 2.3. Identify and secure resource requirements for alternative tactics 2.4. Identify the impact of tactics on a range of factors 2.5. Identify and clearly document tactics

ELEMENT	PERFORMANCE CRITERIA
	2.6. Obtain, collate and record feedback on tactics from stakeholders and incident managers and ensure this is reflected into the documentation according to procedures 2.7. Negotiate stakeholder needs and address
3. Select tactics	3.1. Document findings and feedback on the suitability of different tactics 3.2. Recommend preferred tactics according to procedures 3.3. Document tactics and build into strategies and training doctrines
4. Adopt strategies	4.1. Incorporate documentation on selected tactics into the appropriate incident management manuals 4.2. Notify stakeholders of new tactics 4.3. Incorporate selected tactics into incident training exercises

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- tactics fail to achieve the desired outcomes
- input to tactic development is limited or of less value than expected
- tactics when exercised show gaps or limitations in effectiveness
- adoption of tactics proves problematic or resistance is encountered
- incident containment proves to be of limited success.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- different types of incidents and risks
- incident prediction
- equipment required
- rescue techniques
- intervention and control techniques for heating, fires and explosions
- incident resources and how to access them
- incident response and disaster planning processes and techniques

REQUIRED SKILLS AND KNOWLEDGE

- relevant legislation
- hazard identification and control
- risk management principles and techniques
- structure, roles, capabilities and operational limitations of external resources and agencies
- insurance policies and considerations
- economic impact and considerations.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident.

Consistent performance should be demonstrated. In particular look to see that:

- understanding of incident containment tactics is demonstrated
- understanding of the regulatory environment in which actions

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	need to take place is explained - the impact of the incident on environment, local community and economy of the organisation is understood - tactics are evaluated with consideration given to advantages and disadvantages - hazard risk identification and control is demonstrated - information gathering, analysis and communication are demonstrated to the required level - relevant personnel and experts/specialists with whom consultation must take place are identified These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.
Method of assessment	It may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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**

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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

RANGE STATEMENT

Context	Incidents may include: • fire • explosion • gas or oil leak • accident • bomb threat • missing personnel • combination of the above Tactics are identified through: • consultation with experts • literature review Stakeholders may include: • shareholders • board of directors • employees • unions • contractors • suppliers • insurance companies • local community • fire brigade • police • local emergency management organisations • medical services • relevant public authority
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for

RANGE STATEMENT

	appropriate contextualisation and application of the unit to ensure compliance, however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR449B Monitor legal compliance obligations during incidents

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, a person oversights the operations of an incident or a crisis management team to preclude possible breaches of legislation and regulations during incidents on sites administered by the organisation and advises on compliance issues.

Application of the Unit

Application of the unit	Typically this person may be a company legal officer, environmental officer or a site/facility safety officer. Such incidents might include: • loss of containment such as spills or gas/vapour release • fire • environmental incident or damage occurring through actions taken to resolve an incident • catastrophic failure of plant, assets or equipment • loss of life or occurrence of serious injury The individual would: • advise the management team concerning potential breaches of legislation • monitor the organisations efforts during recovery to maintain compliance • negotiate controls for restoration and clean up activities or other actions • submit organisational reports and prepare for legal proceedings Generally the individual would be part of a crisis management team during any incident however may work independently in some circumstances. At all times they would be liaising and cooperating with other members of the crisis management team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Review incident response plans	1.1. Identify legislation and regulations relevant to possible incident scenarios 1.2. Determine possible compliance issues with planned responses 1.3. Negotiate alternative response plans which do not raise compliance issues 1.4. Ensure plans, equipment and training are modified to reflect changed response plans.
2. Oversee the operations of the incident management team	2.1. Ensure that the incident team is aware of legislation that needs to be complied with during the incident 2.2. Obtain information concerning legal ramifications as required in accordance with organisation's policies 2.3. Ensure accurate recording of all relevant details of all agreed actions

ELEMENT	PERFORMANCE CRITERIA
	2.4. Assess actions taken and proposed against relevant legislation to determine compliance and possible impacts on the company
3. Advise appropriate action to facilitate compliance	3.1. Undertake consultations with regulatory authorities to facilitate minimal impact resolutions 3.2. Advise management of options that are available to remain compliant 3.3. Provide advice on actions to achieve compliance
4. Monitor actions taken to achieve compliance	4.1. Monitor company actions to resolve incidents and achieve compliance or remain compliant 4.2. Document actions taken by the organisation to remain compliant 4.3. Prepare reports for management regarding outcomes from the incident and any material breaches of legislation that have occurred 4.4. Prepare for possible legal proceedings within required timeframe
5. Seek improvements to incident responses	5.1. Identify possible areas for improvement 5.2. Develop improved responses in liaison with relevant people 5.3. Ensure plans, equipment and training are modified to reflect improved response plans.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of issues within the incident response system and to be able to distinguish between causes of issues indicated by:

- failed compliance measures
- inability to locate relevant legislation
- failure to comply with timeframes dictated by legislation or regulation.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

REQUIRED SKILLS AND KNOWLEDGE

- relevant legislation and regulations
- allowable defences for apparent compliance breaches
- organisational policies and procedures
- organisational policy and procedures concerning release of information to external bodies
- the limits imposed by the organisation's negotiating parameters.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.

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

Competence must be demonstrated in the ability to correctly respond to incident situations and in implementing appropriate action. The emphasis should be on the ability to stay ahead of the problem rather than to have to take drastic action in order to recover the situation. In particular look to see that:

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	• incident response plans are compliant and training and procedures reflect those plans • incidents are monitored and advice obtained where required and given to minimise/ prevent non-compliance • the safety and/or successful recovery of the individual and others affected by the incident response is afforded priority in the actions taken • actions taken do not inhibit incident response effectiveness or further contribute to the incident • appropriate documentation including reports, journal entries, logs and/or clearances are completed in accordance with procedures These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all workplace environments it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the incident response system. In your facility this may include (select relevant items): • computers • recording equipment • legislation and regulations Typical problems for your facility may include: • difficulties tracking and identifying relevant legislation or amendments • managing evidence for later investigations or enquiries • interpersonal conflicts • conflicts of interest
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR512B Establish incident response preparedness and response systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the strategic management functions required to develop and establish incident response preparedness and response systems. Using the results of hazard analyses as a starting point, a person would establish an interactive process and manage a collaborative effort which raises the ability of the organisation to respond to an incident.

Application of the Unit

Application of the unit	In a typical scenario a person would gather strategic operational and risk information and translate that into a framework of management and operational systems which enable organisation personnel to effectively prepare for and respond to an incident. During development of and on completion of the system the person would liaise with external agencies or mutual assistance partners. Key features of the competence would be: • establishment of management and operational systems • production of written strategies, tactics and procedures • testing and assessing aspects of the incident response system The person may: • identify and familiarise themselves with appropriate and relevant legislation • consult widely within the organisation • facilitate and manage the introduction and operation of the system • facilitate the review of the incident response system Generally, the person would be part of an incident management team and typically respond to an incident manager. While independent action may sometime be required, the person is expected to liaise, cooperate and consult with other members of the team as necessary.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Clarify the requirements for incident preparedness and response systems	1.1. Access, interpret and clarify the legislative and statutory requirements and standards related to incident preparedness and response systems. 1.2. Access, interpret and clarify the site requirements relating to systematic analysis of hazards, technical and operational information. 1.3. Consult and collaborate with relevant stakeholders, specialists and emergency services as necessary and in accordance with legislative requirements
2. Design incident response plans and systems	2.1. Develop an organisational structure for the management of incident preparedness and response from an analysis of relevant technical and operational

ELEMENT	PERFORMANCE CRITERIA
	information 2.2. Establish incident response procedures for management of decision making processes and decision monitoring systems 2.3. Develop incident response procedures for the containment of various types of incidents from an analysis of relevant technical and operational information 2.4. Identify and develop required management and operational systems to support incident preparedness and response in compliance with legislative and site requirements 2.5. Build in processes for evaluation into the plan and system and comply with legislative requirements and/or special site needs 2.6. Ensure all aspects of the plan are consistent with commitments to health, safety and protection of the environment 2.7. Review the plan and systems in conjunction with relevant stakeholders and specialists
3. Manage the implementation of the incident preparedness plan and response systems	3.1. Document and disseminate plans and systems to the appropriate personnel 3.2. Identify required services, personnel, equipment and resources for various types of incidents 3.3. Ensure arrangements are made to ensure required services, personnel, equipment and resources are ready for immediate mobilisation/deployment
4. Ensure periodic and timely evaluation of the incident preparedness plans and response systems	4.1. Encourage, receive and review suggestions and recommendations for changes to incident preparedness plans and response systems and where appropriate, assist implementation 4.2. Initiate and conduct evaluations as prescribed by the plan and in accordance with commitment to health, safety, protection of the environment and legislative requirements

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- poorly formulated and developed incident preparedness plans
- inaccurate or misleading site plans
- lack of access to site information and recording systems
- poor hazard identification and control practices
- inaccurate evaluation of systems
- inaccurate or misleading reports
- lack of identified or established site facilities for incident management
- inability to communicate effectively with people personally or through technical devices during incidents
- ineffective or disorganised personnel and resources
- poorly developed action plans
- inappropriate or improper information analyses
- inappropriate or ineffective decisions
- inability to participate as a team member.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- incident response and disaster planning processes and techniques
- relevant legislation and standards
- equipment required for different types of equipment
- incident resources and how to access them
- different types of incidents and risks
- hazard identification and control methods and procedures
- risk management principles and techniques
- structure, roles, capabilities and operational limitations of external resources and agencies
- rescue techniques
- intervention and control techniques for heating, fires and explosions
- media policies and procedures
- insurance policies and considerations
- economic impact and considerations.

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances. Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident. Consistent performance should be demonstrated. In particular look to see that: • incident response planning is appropriate for the circumstances • containment strategies are developed for management of different types of incidents • understanding of the role of stakeholders and specialists at incidents is demonstrated • understanding of the structure and roles of on-site functions and personnel is demonstrated

EVIDENCE GUIDE	
	• information gathering, analysis and communication are conducted effectively • action plan development and evaluation meets organisational requirements • establishment of incident operations facilities meets organisational requirements • effective post-incident management planning is undertaken • evaluations of incident preparedness and response plans are successfully demonstrated These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.
Method of assessment	It may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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
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.

RANGE STATEMENT	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Incidents may include: • fire • explosion • gas or oil leak • accident • bomb threat • missing personnel • combination of the above Management and operational systems to support incident preparedness and response include (but are not limited to): • evacuation • emergency operations structure • communications • information management • documentation and reporting requirements • resource management • training • audit and review system • financial management • post incident actions External services may include (but are not limited to): • fire brigade • ambulance • medical services • local emergency management organisations • media • security services • solicitors • engineers • scientists
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.
Relationship to	Organisations within the Chemical, Hydrocarbons and Oil Refining

RANGE STATEMENT**Major Hazard Facility Legislation**

industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR523B Manage corporate media requirements in a crisis

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the competency required of an individual made responsible for the development of a media strategy, the management of the media and provision of information during a major incident. The person would be a member of the incident management team.

Application of the Unit

Application of the unit	Key aspects of the competence include: • complying with organisational policies and directions • presenting potential positive and negative views about newsworthiness of information • arranging access for media crews and equipment • identifying opportunities for photographic/film opportunities. The individual would: • assist in arranging and managing on-site interviews • help arrange interviews with particular personnel • look for and inform media personnel of possible news angles • assist in the development of positive human interest interviews and stories. Generally, the individual would be part of a team during an emergency situation though may be required to take independent action. At all times, they would be liaising and cooperating with other members of the team. This unit is based on, but is not equivalent to, <i>PUACOM009A Manage media requirements at major incidents</i>.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Assess scene and organisation requirements.	1.1. Clearly define restricted and/or special access areas to media personnel to safeguard the operation and prevent contamination of evidence 1.2. Control media access to personnel/volunteers/victims/casualties 1.3. Assess operational responsibilities and provision of information to media.
2. Develop media strategy.	2.1. Use media plan to form the media strategy 2.2. Allocate media briefing area with required resources where possible 2.3. Gain approval for information releases where appropriate 2.4. Make arrangements to meet media requirements according to incident characteristics and current developments 2.5. Gain media co-operation in order to coordinate information flow and to provide information to the public on matters of

ELEMENT	PERFORMANCE CRITERIA
	safety and public interest.
3. Brief media.	3.1. Select and brief organisational media representative according to availability, knowledge of incident, media presence and role played in the incident 3.2. Change media strategy at any time to suit operational demands and level of incident 3.3. Schedule information briefing sessions and tours at appropriate times in line with operational responsibilities and media requirements 3.4. Provide media personnel and VIP with personal protective clothing or equipment where appropriate.
4. Provide information to media.	4.1. Follow organisational protocols when liaising with the media 4.2. Provide organisational media representative with current developments of incident where appropriate 4.3. Schedule interview and photo opportunities and conduct to provide information where appropriate 4.4. Consult with other organisations at the incident to ensure a consistent presentation of information to the media 4.5. Maintain accurate records of media enquiries and interviews 4.6. Maintain a two-way communication process between organisation and media.
5. Promote the organisation via the media.	5.1. Promote work and achievements of organisation, volunteer and other organisation personnel at incident throughout the incident to assist in maintaining morale and public profile 5.2. Ensure own demeanour and presentation reflects the professional standards of the organisation and support for victims and others affected by the incident.
6. Control hazards associated with media coverage.	6.1. Identify hazards in work environment 6.2. Assess the risks arising from those hazards 6.3. Implement measures to control those risks in line with procedures and duty of care.
7. Respond to problems.	7.1. Identify possible problems in equipment or process 7.2. Determine problems needing action 7.3. Determine possible fault causes 7.4. Rectify problem using appropriate solution within area of responsibility 7.5. Follow through items initiated until final resolution has occurred 7.6. Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
Competence includes the ability to isolate the causes of issues within the incident response system and to be able to distinguish between causes of issues indicated by: • media entering or encroaching on hazardous areas • media organisations using unauthorised contacts with emergency personnel • lack of cooperation by the media with the company • premature release of details concerning evidence or about incident victims • failures to adhere to company policies and/or guidelines for media communication.
Required knowledge
The knowledge referred to in the Evidence Guide for this unit includes: • dealing with the media • access to key operational information concerning the incident • key contact details, eg emergency hotline numbers • potential and actual road closure details • factors behind facility closures • issued warnings, danger zones and evacuation details • procedures and company policies concerning persons police are seeking to interview • company policy on public information/assurance.

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the

EVIDENCE GUIDE

	assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances. Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk-throughs of the relevant competency components and may include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident. Consistent performance should be demonstrated. In particular look to see that: • incident responses are in accordance with company procedures • correct incident response equipment (where required) is used appropriately • actions taken do not inhibit incident response effectiveness or further contribute to the incident • appropriate documentation, including reports, journal entries, logs and/or clearances are completed in accordance with procedures These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site

EVIDENCE GUIDE	
assessment	incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all workplace environments it may be appropriate to assess this unit concurrently with relevant units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency covers the management of the corporate media response during an incident. The media may include: • local media, eg newspapers, radio and local news sheets • national media, eg newspapers, magazines, TV, radio • news personnel, eg reporters, photographers, TV crews • It includes all such items of equipment and workplace operations which form part of the incident response system. This may include: • personal protective equipment • communication equipment, eg telephones, facsimiles, tape recorders, cameras. Typical problems for your facility may include: • unauthorised access to hazardous areas • corporate representatives and what they say

RANGE STATEMENT	
	• dealing with uncooperative media • communication breakdowns • incorrect or misleading information.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR575B Coordinate welfare support activities in response to an incident

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the competencies required by a person to oversee and coordinate all welfare support activities in response to an incident. It involves setting up the necessary logistics and ensuring that work is carried out in accordance with legislation, company welfare program and associated procedures.

Application of the Unit

Application of the unit	Key aspects of the competence include: • establishing effective welfare support systems • ensuring that welfare support systems are effective in operation and focus • establishing workable linkages between welfare and other aspects of organisational life The person may: • deal sympathetically with family members • ensure that family members are aware of the range of support services available • assist family members to obtain those services • make recommendations to the organisation concerning changes or improvements to the system The person would typically be a member of a senior management team during an incident situation. While there may be occasion to act independently, he/she is expected to liaise with other members of the team as necessary.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Notify families of those effected by the incident	1.1. Ascertain details and circumstances and state of affected employees affected by the incident 1.2. Accurately and promptly relay relevant information to families of affected employees 1.3. Supply appropriate and timely situational reports when necessary
2. Set up logistical support required for carrying out welfare support activities	2.1. Determine the logistical requirements to effectively carry out welfare support activities 2.2. Acquire and set up logistical requirements in accordance with procedures
3. Co-ordinate and ensure that welfare support activities are conducted appropriately	3.1. Ensure that all workers conduct welfare support activities in accordance with procedures, reflect a sensitivity to the needs of those affected by the incident and promote a positive image of the company

ELEMENT	PERFORMANCE CRITERIA
	3.2. Coordinate proper documentation of results of welfare support activities
4. Respond to issues arising from welfare support activities	4.1. Determine issues arising from welfare support activities 4.2. Address issues when within the area of responsibility 4.3. Relay issues outside the area of responsibility to the appropriate personnel for action 4.4. Follow through issues until final resolution has been reached 4.5. Maintain communication with appropriate personnel or persons regarding the progress and/or resolution of issues
5. Contribute to the evaluation of the company welfare support activities	5.1. Conduct consultations to assess the effectiveness of welfare support activities 5.2. Provide input/feedback to the appropriate personnel for evaluation of company welfare support activities

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- lack of effective communication with family members
- confusion or misunderstandings concerning welfare service provision
- contradictory or misleading information
- internal confusion or obfuscation by sectors of the organisation.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- company incident response structures and operations
- the individual's own role within the incident response structure, including its parameters, boundaries and/or limitations
- company welfare program and associated procedures
- company legal responsibilities to those affected by the incident

REQUIRED SKILLS AND KNOWLEDGE

- rights and responsibilities of those affected by the incident
- company security, confidentiality and communication requirements
- reporting procedures of the organisation.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk throughs of abnormal operations) and off the site.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident.

Consistent performance should be demonstrated. In particular, look to see that:

EVIDENCE GUIDE	
	• assessment of logistical requirements is based on a sound understanding of welfare support activities • acquisition or setting up of logistical requirements is in accordance with procedures • steps are taken to ensure that all welfare support activities are in accordance with procedures and promote a positive image of the company • appropriate consultations with team members or appropriate personnel are conducted as necessary • issues arising from welfare support activities within area of responsibility are resolved appropriately • issues outside of area of responsibility arising from welfare support activities are referred to appropriate personnel and followed through until resolution has been reached • actions taken do not inhibit recent incident response effectiveness or further contribute to the incident • the safety and/or successful recovery of persons affected by the incident is afforded priority in the actions taken • appropriate documentation, including reports, journal entries, logs and/or clearances are completed in accordance with procedures These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.
Method of assessment	In all environments it may be appropriate to assess this unit concurrently with relevant units.
Guidance information for	Assessment processes and techniques must be

EVIDENCE GUIDE	
assessment	culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Logistical requirements may include: • call centre • setting up a team of appropriate workers to assist • quick access to relevant files and documents • arrangements with external agencies financial requirements
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR622B Build partnerships to improve incident response capacity

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the building of partnerships to improve the organisation's capabilities to respond to incidents.

Application of the Unit

Application of the unit	In a typical scenario the individual would establish, as part of the organisation's strategic preparedness, mutual aid provisions within inter-company relationships so that assistance may be available as needed in a crisis. The person would typically be a member of the crisis management team and would initiate, formalise and manage joint efforts with other organisations to improve incident response capacity. Key aspects of the competence include: • developing philosophies and strategies which assist to build partnerships • laying the foundations for mutual cooperation and assistance • establishing structures through which strategic partnerships can be implemented The person would: • identify areas of cooperation in relation to incident response • initiate talks/negotiations on cooperative efforts/joint activities • manage the relationship in order to enhance incident response capacity • manage the documentation of agreed cooperative efforts/joint activities • manage the relationships and ensure sustainability Generally, the person would be a member of senior management and a member of the crisis management team. Although independent action may be required, he/she will be expected to coordinate, liaise and consult with other members of the team and other appropriate personnel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify opportunities for specific partnerships	1.1. Identify opportunities for joint/cooperative efforts towards incident response 1.2. Undertake consultation within the organisation to identify the types of partnerships and mutual interest to meet organisational needs 1.3. Develop a strategy on the types of partnership organisations and partnership opportunities 1.4. Approach specific targeted organisations, discuss expectations, ability to meet those expectations and areas of mutual interest
2. Develop a framework for the partnership	2.1. Consult potential partners to develop frameworks that will meet the needs of all partners 2.2. Establish the characteristics of the partnership with selected partners

ELEMENT	PERFORMANCE CRITERIA
	2.3. Confirm partnership characteristics, including structure, scale, roles, goals and time frames with the partners 2.4. Develop systems to enhance mutual benefit and value contributions from the partnership 2.5. Develop and communicate measures for success to stakeholders 2.6. Define an agreed exit strategy
3. Manage the relationship in order to enhance incident response	3.1. Undertake regular consultation, communication and mutual information sharing with all partners 3.2. Identify, monitor and review challenges facing the partnership and action issues 3.3. Seek, communicate, document and review opportunities for learning from the partnership 3.4. Undertake joint venture exercises to improve incident response capacity where appropriate 3.5. Provide mutual assistance in ensuring compliance to changes in legislative or regulatory requirements
4. Rebuild partnerships after an incident	4.1. Incident is examined by partners 4.2. Issues arising from the incident are explored 4.3. Issues are followed through and addressed 4.4. Resolutions are developed to prevent re-occurrence 4.5. Information and resolutions resulting from discussions are disseminated appropriately
5. Evaluate the effectiveness of the partnership	5.1. The flexibility and appropriateness of responses to issues/challenges facing the partnership is evaluated 5.2. Performance against agreed measures is evaluated and communicated 5.3. Capability to implement the exit strategy is monitored, reviewed and communicated to stakeholders

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Competence includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- inability to contact key partners in the event of a crisis
- response times or objectives confused or outside agreed parameters
- gaps or overlaps in response, which reduce effectiveness of the response
- lack of ability to communicate effectively within the organization.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- company incident response structures and operations
- the individual's own role within the incident response structure, including its parameters, boundaries and/or limitations
- roles, responsibilities and needs of the individual's own organisation
- roles, responsibilities and needs of other organisations
- understanding of the mission, values and culture of the organisations targeted for and within the partnership
- clarity of 'chain of command' - who will drive the partnership and how it relates to decision making in the organisations
- company security, confidentiality and communication requirements.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include

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	'walk-throughs' of the relevant competency components and may include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident. Consistent performance should be demonstrated. In particular look to see that: • strategic communication and conflict resolution skills are demonstrated • strategic planning is evident, including the developing of objectives, strategies and relevant budgets • partnerships are identified and inclusive proposals developed • benefits to potential partners and the organisation are identified • ability to initiate, coordinate and conduct discussions with pertinent external organisations in a manner that promotes a positive image of the company is present • learning from partnership are brought back into the organisation and analysed for adaptation where appropriate to improve incident response • effective consultation occurs with team members or appropriate personnel on issues • follow-up occurs on all issues until resolution is achieved • actions taken enhance incident response effectiveness These assessment activities should include a range of problems, including new, unusual and improbable

EVIDENCE GUIDE	
	situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.
Method of assessment	In all facilities it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Organisations with whom partnerships can be established include: • parent company • joint venture partners • organisations within a given geographical radius • external agencies The framework describes the structure, policy and processes of the partnership to best meet stakeholder needs. Measures of success refers to the quantifiable and qualitative goals that

RANGE STATEMENT	
	the partnership has developed to indicate that its purposes are being achieved. Challenges facing the partnership refers to establishing a cohesive network for effective incident response, rebuilding the partnership in the event of an incident with partners and promoting a positive image of the Company. Opportunities for learning refers to practices of reflection throughout the workings of the partnership to seek opportunities for improvement in the organisation's incident response, learning from incidents or systems/processes/procedures in own company and partner organisations. Agreed measurement systems refers to the process of measuring the identified success criteria as established by the partners.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOMIR650B Manage a crisis

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the competency to participate as a crisis management team member and manage the organisation through a crisis. It applies to a person who would typically be a manager/senior manager for the organisation.

Application of the Unit

Application of the unit	In a typical scenario, a person would establish and manage the implementation of crisis management and intervention strategies which can be used to reduce the risk to the organisation's personnel, other responders, commercial, reputation and contractual assets during incidents. A crisis is defined as an incident of a magnitude that affects the integrity and effectiveness of the organisation or is liable to cause a significant problem to the business. Key aspects of the competence include: • minimising escalation of the crisis • establishing contingency plans for dealing with the crisis • sourcing and managing of resources required • manage communication within and outside the organisation • optimise the organisational response to minimise impact of the crisis The individual may: • ensure that organisational response is appropriate • use communication skills to deal with stakeholders' concerns Generally the person would be in control of personnel during an incident. At all times they would be liaising and cooperating with other members of the management, other teams and possibly external organisations.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Define the crisis.	1.1. Assess crisis and probable implications 1.2. Identify and monitor secondary threats to situation 1.3. Assess and evaluate data to determine process/system status 1.4. Receive, collate and assess external information 1.5. Identify probable cause of crisis from available information and resources 1.6. Identify, allocate and confirm roles of personnel in the crisis management process.
2. Establish contingency plans.	2.1. Identify appropriate contingency plans for the organisation 2.2. Identify additional resources required 2.3. Coordinate the development of alternative contingency

ELEMENT	PERFORMANCE CRITERIA
	plans to cater for variations in the crisis.
3. Establish communications.	3.1. Activate communication systems 3.2. Establish communication with appropriate stakeholders, including customers and suppliers 3.3. Activate reporting processes and ensure continuous monitoring and evaluation of incident 3.4. Establish/activate command and control facilities.
4. Assess the crisis.	4.1. Conduct a risk assessment of all factors impacting upon the response 4.2. Conduct an initial assessment of resources required 4.3. Identify constraints which may impede the response 4.4. Identify and assess initial response options.
5. Implement crisis management plan.	5.1. Identify appropriate crisis management plan(s), including contingency plans if required 5.2. Manage response in accordance with plan and available personnel/equipment 5.3. Prioritise responses taking into account needs of stakeholders 5.4. Modify plan and deploy additional resources as required 5.5. Monitor, evaluate and adjust restoration strategies as required.
6. Document and review crisis and response.	6.1. Ensure recording occurs in a timely manner 6.2. Record and analyse feedback from stakeholders/witnesses 6.3. Identify and record root cause/cause tree of crisis 6.4. Generate and distribute required reports and findings to appropriate personnel.
7. Manage post crisis operations	7.1. Account for and demobilise resources 7.2. Initiate post incident recovery 7.3. Evaluate and document effectiveness of operations 7.4. Debrief all relevant people 7.5. Recommend improvements to the crisis management process

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- inappropriate or lack of contingency planning
- lack of commitment by the organisation to training and incident response exercises
- deviations from standard operating procedures or incident response plans
- "loss" of personnel in either practices or incidents
- strategic failures in communications.

Required knowledge

Competence includes an understanding of the organisation's crisis management procedures to the level needed to manage the response and recognise and resolve problems. In particular it includes knowledge of:

- crisis management plans
- crisis management principles
- contingency planning
- hazards (physical, regulatory and business) arising from typical crises
- stock market and shareholder reactions
- regulatory agency obligations and expectations
- media response policies, practices and procedures
- welfare obligations and responses.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a

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	manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances. Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include 'walk throughs' of the relevant competency components and may include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and walk-throughs of abnormal operations) and off the site.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident. Consistent performance should be demonstrated. In particular look to see that: • the crisis is assessed adequately • the appropriate crisis management plan is implemented • contingency planning is practiced • obtaining and recording of relevant information is adequate • post crisis recovery is initiated • the crisis is critically analysed to improve future performance These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

EVIDENCE GUIDE	
Context of and specific resources for assessment	Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.
Method of assessment	In all facilities it may be appropriate to assess this unit concurrently with relevant PMAOMIR units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency covers the management of a crisis within the organisation that may include: • fire, explosion • loss of containment, eg gas leaks, spills • damage to facilities, eg accidents, crashes, aircraft • natural disasters, eg cyclones, wind, rain, earthquake, flood • other, eg riot, civil unrest, terrorism • threats to supply, eg raw materials interruption, energy or services supply. Communications systems may include: • any form of communication, eg direct, telephone, two-way radio,

RANGE STATEMENT	
	pager, computer, electronic mail, operating logs, intercoms. Assessment of the crisis may include: - any aspect which affects the management of the situation, eg: - type of incident - risk to life, property and environment - hazards - capability of assigned personnel - adequacy of allocated equipment - information gathered from existing plans/databases, - forecasts - meteorological profiles. Constraints that may impede the response to the crisis need to be considered and may include: - legislation, organisation procedures - resources, eg time, financial, personnel, organisational - prevailing weather, seasonal factors - restrictions on duration of work or the conditions under which personnel may be employed - sacred sites, other areas of environmental and cultural significance, wilderness areas, hazardous areas, other restricted areas.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Relationship to Major Hazard Facility Legislation	Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite Units		

PMAOPS101C Read dials and indicators

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers making (or taking) readings/measurements in a variety of sites and locations, using common types of plant instrumentation. It also covers recording measurement results in a prescribed format, according to procedures and with the appropriate level of detail included in all reports.

Application of the Unit

Application of the unit	In a typical scenario an operator patrols the plant taking a range of readings to complete logs and check on the operation of the plant. The operator needs to interpret the display on the instrument and record the appropriate reading. As part of this process, they check that the instrument is within calibration (where appropriate) and make a judgement as to whether the reading is 'reasonable' or whether some action needs to be taken.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Contribute to controlling hazards in work area.	1.1. Identify hazards in work area 1.2. Take appropriate action to control risks according to procedures.
2. Identify appropriate measuring device readings.	2.1. Explain the need for calibration and where appropriate, confirm the calibration of the measuring device 2.2. Select appropriate units on the measuring device 2.3. Select appropriate scale(s) on the measuring device.
3. Perform measurements.	3.1. Identify the range of results that could be obtained 3.2. Identify and take account of relevant external factors 3.3. Perform measurements using appropriate techniques 3.4. Identify measurements outside the range of expected results 3.5. Take action on measurements outside expected range according to procedures.
4. Record results	4.1. Record readings accurately in the appropriate format 4.2. Record the results to the appropriate level of detail.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
efficient and effective operation of plant/equipment

REQUIRED SKILLS AND KNOWLEDGE

- hazard analysis
- completing plant records
- communication
- problem solving.

Required knowledge

- basic units of measurement
- measuring devices, including gauges, dip-sticks, thermometers and the like
- graphs and scales
- workplace Standard Operating Procedures (SOPs) related to this competency
- typical problems with measuring equipment applicable to this competency
- procedures for reporting or dealing with typical equipment problems and threats to safety.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. While it is not expected that the operator will understand the full implications of readings outside the normal range, there should be awareness of the safety implications

EVIDENCE GUIDE	
	and the appropriate priority for response for such readings. Consistent performance should be demonstrated. In particular look to see that: • readings which are out of range or unusual/unexpected signs of problems or potential problems with the equipment/processes are recognised • appropriate action is taken in a timely manner • hazards are recognised and appropriate action is taken to control risks arising from such hazards. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus, with a walk-through forming part of the response. The assessment activities should include responding to a range of problems.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It may be appropriate to assess this unit concurrently with units related to HSE.
Guidance information for assessment	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
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

RANGE STATEMENT	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit applies to reading process instrumentation in any plant or related situation. Readings may need to be made at heights, in wet or restricted conditions, or close to hot or moving equipment.
Dials and indicators	Typical dials and indicators include (select relevant items): • analogue dials, such as: • pressure gauge • rev counter • temperature dial • digital readouts, such as: • pH meter • temperature probe • ammeter • flow meter • weigh scales.
Calibration checks	Calibration checks could include: • checking the date that the next calibration is required, eg weigh scale, pressure gauge • using a calibration button on the instrument, eg zero button on an ammeter, calibration button on an electronic meter.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria

RANGE STATEMENT

	and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS105C Select and prepare materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the selection and preparation of materials for use in production processes. The focus of this unit is finding and delivering the right materials to the process in the right condition. Along the way, some minor preparation may be required.

Application of the Unit

Application of the unit	A typical application of this competency could be an operator preparing a range of chemicals or other substances for use in a batch process. The operator would visually inspect each item for deterioration or damage, and follow procedures to prepare materials. Once prepared, the operator would then assemble the materials for supply to production areas. This unit only covers those situations where mixing, grinding, testing, etc, are an incidental part of the process of preparing materials for use in production. It does not cover those situations where the primary function is mixing, grinding, testing, etc. Instead see: • <i>PMAOPS202A Operate fluid mixing equipment</i> • <i>PMCOPS203A Operate grinding equipment</i> The operator requires a knowledge of classes of compatible and incompatible chemicals, as well as an understanding of HAZCHEM symbols and codes, and hazardous substances regulations. This includes the procedures for safe handling and storage of chemicals and hazardous substances. The operator also needs to be able to follow procedures for disposal of chemicals and other hazardous substances, and for dealing with spills or other containment issues.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify and locate materials.	1.1. Identify material requirements correctly from documentation 1.2. Identify type, quantity and quality of materials 1.3. Identify material hazards and handling procedures 1.4. Locate and check materials to procedures 1.5. Confirm availability of required quantity of materials 1.6. Record and report material shortages.
2. Contribute to controlling hazards.	2.1. Identify other hazards in work area 2.2. Take action to control material hazards as per documentation 2.3. Take appropriate action to control other hazards in the workplace.
3. Measure quantity of materials	3.1. Identify types of measuring equipment and their purpose, and select according to requirements 3.2. Measure and assemble required quantities 3.3. Check material quantities against documentation 3.4. Document and label materials

ELEMENT	PERFORMANCE CRITERIA
	3.5.Deliver materials to correct location.
4. Prepare materials as required.	4.1.Check that hoppers, bins and holding tanks are free from contamination 4.2.Identify classes of compatible and incompatible chemicals 4.3.Prepare materials to procedures.
5. Store assembled materials.	5.1.Identify the storage conditions required for the main classes of chemicals 5.2.Identify materials that have special storage requirements 5.3.Store and supply materials.
6. Dispose of waste materials.	6.1.Correctly identify waste materials 6.2.Dispose of materials to procedures and OHS and environmental requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Required knowledge

- classes of compatible and incompatible chemicals
- types of materials in plant and their storage requirements
- other special storage requirements
- basic measurement procedures
- routes of entry of chemicals to the body (basic only)
- procedures for safe handling and storage of chemicals and hazardous substances
- correct selection, use and maintenance of required PPE
- labeling requirements (dangerous goods codes, classification numbers, packaging group numbers)
- HAZCHEM symbols and codes
- hazardous substances regulations

REQUIRED SKILLS AND KNOWLEDGE

- spill containment and disposal procedures
- workplace Standard Operating Procedures (SOPs) related to this competency
- environmental requirements related to waste disposal
- workplace processes sufficient to recognise non-standard situations
- workplace hazards and methods of controlling hazards according to procedures
- procedures for reporting or dealing with non-standard or hazardous situations
- materials safety data sheets (MSDSs).

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which could include disruptions to normal, smooth operation.

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

Consistent performance should be demonstrated. In particular look to see that:

- all operations are performed to procedures and OHS and environmental requirements
- signs of problems or potential problems with the equipment/processes are recognised
- appropriate action is taken in a timely manner
- hazards are recognised and appropriate action is taken to control risks arising from such hazards.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus, with a walk-through forming part of the response. The assessment activities should include responding to a range of problems.

Context of and specific resources

Assessment will require access to an operating plant over an extended period of time, or a suitable method

EVIDENCE GUIDE	
for assessment	of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It may be appropriate to assess this unit concurrently with HSE units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Tasks	This competency is typically performed by operators, weighers, mixers or stores personnel, and includes the following tasks (select relevant items): • handling raw chemicals • storing raw chemicals • pre-production assembling and labelling of materials • pre-production inspection of materials, usually involving visual inspections only for identification of deterioration or damage • pre-production measuring of materials, by weight, volume or density • disposal of waste materials • identifying and reporting hazards, safety and other issues that could

RANGE STATEMENT	
	affect the operation of the plant.
Materials preparation	Typical examples of preparation required might include (select relevant items): • warming to melt waxy materials • breaking up solid materials into pieces or smaller lumps • passing materials through an in-line delumper • blending a powder or liquid into a solution prior to use in the process • blending powders prior to production • dilution of solutions • preparation of a solution for dosing into a process.
Equipment	Equipment may include: • buckets • stirring paddle • propeller or drum mixers • delumpers • hammers or axes • measuring equipment including scales, flow meters and graduated vessels • personal protective equipment
Documentation	Documentation may include: • materials safety data sheets (MSDSs) • enterprise procedures • labelling requirements (dangerous goods codes, classification numbers, packaging group numbers) • HAZCHEM symbols and codes • spill containment and disposal procedures.
Materials	Materials may include: • raw materials • packaging materials • consumables.
Problems	• Typical problems are restricted to responding in a routine, predetermined manner as specified in the procedures. • All operations are performed to procedures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions

RANGE STATEMENT	
	• standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
MSDS	An operator is expected to be aware of an MSDS, its general structure and where to find the methods of use, cautions and actions in an emergency. They are not expected to understand the full text of an MSDS.
Material hazards and handling procedures	Material hazards and handling procedures may be identified from label • HAZCHEM symbol • MSDS • other relevant source.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS201B Operate fluid flow equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the operation of the range of pumps and valves typically encountered in the fluid flow system of a processing plant. It includes identifying, operating, monitoring and troubleshooting these items.

Application of the Unit

Application of the unit	In a typical scenario, an operator uses a number of general purpose pumps, piping and valves to move liquids from a storage tank area into the processing plant and products to the finished goods tanks. The operator utilises in-line mixers, strainers and filters, valves, controls and meters to complete this work. The operator would: • identify and report operational problems • be aware of and contribute to a safe working environment • contribute to the safe and productive operation of the equipment • operate, monitor and maintain equipment using relevant procedures. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel. This competency covers all general duty pumps, their associated drivers (motors) and valves. It does not cover special duty pumps (eg hydrocarbon transmission pumps), drivers which incorporate ancillaries and valves which are used for high pressure/flow situations (see <i>PMAOPS221 Operate and monitor prime movers</i>, <i>PMAOPS222B Operate and monitor pumping systems and equipment</i> and <i>PMAOPS223B Operate and monitor valve systems</i>). Competence in this unit (<i>PMAOPS20B1 Operate fluid flow equipment</i>) would preclude counting <i>PMAOPS223B Operate and monitor valve systems</i> towards a qualification.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Operate pumps.	2.1. Identify the type of pump 2.2. Start up and shut down pump as required 2.3. Adjust flow and head/pressure as appropriate to type of pump 2.4. Complete routine checks and reports taking action as required 2.5. Change over pumps as required.
3. Operate pump drivers.	3.1. Monitor critical variables such as amps, temperature and vibration

ELEMENT	PERFORMANCE CRITERIA
	3.2.Keep critical variables in range 3.3.Recognise trends/patterns which indicate a potential or actual problem with the pump driver 3.4.Take action to ensure driver as required.
4. Operate valves.	4.1.Identify the type of valve 4.2.Operate valve in a manner appropriate to the valve type 4.3.Complete routine checks and reports, taking action as required.
5. Respond to fluid system problems.	5.1.Monitor fluid flow system frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 5.2.Recognise issues requiring action 5.3.Take appropriate action.
6. Isolate and de-isolate pump.	6.1.Isolate equipment 6.2.Make safe for required work 6.3.Check plant is ready to be returned to service 6.4.Prepare plant for return to service .

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
• efficient and effective operation of plant/equipment • hazard analysis • completing plant records • communication • problem solving.
Required knowledge
Competence includes an understanding of the fluid flow system and its integral equipment to a level needed to control the system, and recognise and resolve operational problems. In particular it includes a knowledge of: • principles of operation of plant/equipment • physics and chemistry relevant to the process unit • process parameters and limits eg temperature, pressure, flow, pH

REQUIRED SKILLS AND KNOWLEDGE

- duty of care obligations
- hierarchy of control
- communication protocols eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the fluid flow system and the function of each
- correct methods of starting, stopping, operating and controlling flow
- causes of head loss in piping systems (including comparison of fittings using Le/d concept, fluid and pipe material properties, flow geometry, etc)
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems (such as impellers, seals or bearings)
- types and causes of fluid flow problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant

EVIDENCE GUIDE	
	(during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with units covering: • measurements and readings • housekeeping • communication.

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	In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i> The assessment should cover at least one type of centrifugal pump and one type of positive displacement pump, as well as at least two different types of valves for the operator to be regarded as competent.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency is typically performed by all operators. It includes items of equipment such as: • pumps, including various types of centrifugal, positive displacement, acid egg • valves, such as globe, needle, gate, butterfly, plug cock, wedge plug, ball cock, non-return, diaphragm, pneumatic globe, pneumatic butterfly • piping systems and components, including bends and elbows, tee pieces, expansion mechanisms, pipe joints, reducers, nipples, orifices, in-line mixers, filters and strainers, flexible hoses and couplings • shaft seals, such as stuffing boxes, mechanical seals, fluid seals, labyrinth seals. The effect of pipe fittings on pump performance and problems/problem analysis is also included.

RANGE STATEMENT	
	All operations are performed to procedures.
Problems	Typical problems include: • cavitation • seal leaks • head loss/low flow • bearing problems.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Start up shut down as required	Start up shut down as required includes: • start up and shut down to/from normal operating conditions • start up and shut down to/from isolated, cold, empty • all other conditions experienced on the plant. • ie from any condition to any condition experienced on the plant.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS202B Operate fluid mixing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the operation of the range of fluid mixers found in fluid processing plants. This competency is typically performed by all operators using mixing equipment.

Application of the Unit

Application of the unit	In a typical scenario an operator uses a baffled mixing tank (or other mixer) to make a product to specification. This covers the loading of liquid and perhaps solid materials into the mixing equipment. In this example the operator monitors the mixing to ensure the components are dispersed appropriately and checks the resulting product to ensure it complies. This unit does not cover mixing which is part of the preparation of materials (see <i>PMAOPS105C Select and prepare materials</i>) nor the incidental mixing which occurs in a reaction vessel (see <i>PMAOPS220B Monitor chemical reactions in the process</i> or <i>PMAOPS302B Operate reactors and reactor systems</i>) or in-line mixers (see <i>PMAOPS201B Operate fluid flow equipment</i>).³ The operator would: • identify and report operational problems • be aware of and contribute to a safe working environment • contribute to the safe and productive operation of the equipment • operate, monitor and maintain equipment using relevant procedures. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare mixing equipment.	2.1. Identify type of fluid mixer 2.2. Identify appropriate applications for the mixer type 2.3. Check materials.
3. Operate fluid mixing equipment.	3.1. Charge materials 3.2. Start up/shut down fluid mixing equipment as required 3.3. Adjust mixing conditions as required 3.4. Check product 3.5. Adjust product as instructed or to procedure 3.6. Discharge product 3.7. Complete routine checks and reports, taking action on unexpected readings and trends.
4. Isolate and de-isolate plant.	4.1. Isolate plant 4.2. Make safe for required work

ELEMENT	PERFORMANCE CRITERIA
	4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Required knowledge

Understanding of fluid mixing equipment and its integral equipment to a level needed to recognise and resolve operational problems. In particular it includes a knowledge of:

- all items on a schematic of the mixing system and the function of each
- fluid mixing principles, such as shear, viscosity and concepts of uniformity
- principles of operation of fluid mixing equipment
- physics of operation
- correct methods of starting, stopping, operating and controlling mixing equipment
- typical mixing problems, and their causes and remedy, within operator's scope of skill level and responsibility
- duty of care
- materials safety data sheets (MSDSs)
- HAZCHEM symbols and codes
- hazardous substances regulations
- spill containment and disposal procedures
- procedures related to this competency
- environmental requirements related to waste disposal
- workplace hazards and methods of controlling hazards.
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies

REQUIRED SKILLS AND KNOWLEDGE

- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems (such as impellers, seals or bearings)
- types and causes of mixing problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined

EVIDENCE GUIDE	
	• appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with units about: • measurements • housekeeping • communication. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the communication ability, language and literacy capacity of the assessee and the work being performed.

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 if the

RANGE STATEMENT	
candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Fluid mixing processes can vary from continuous mixing processes as typically found in oil plants to batch mixing as commonly used in chemical plants and paint manufacture. It covers the mixing of two or more materials to make a product.
Equipment	This competency includes items of equipment such as: • mixers for low, medium and high viscosity fluids • jet mixing • top and side entry mixers • propeller, and pitched and square bladed turbine impellers.
Problems	Typical problems include incorrect: • mixing time • power consumption • uniformity • vortexing • aeration.
Remedial actions	Remedial actions include changing: • position and angle of baffles where appropriate • impellor (angle, size, shape or speed) • feed rate of fluids.
Mixing conditions	Mixing conditions may be adjusted by: • baffles • mixer speed • mixing duration • other means
Start up shut down as required	Start up shut down as required includes: • start up and shut down to/from normal operating conditions • start up and shut down to/from isolated, cold, empty • all other conditions experienced on the plant. ie from any condition to any condition experienced on the plant.
Appropriate action	Appropriate action includes: • determining problems needing action

RANGE STATEMENT	
	• determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS203B Handle goods

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the moving of goods into and out of a plant/chemical store. The operator would handle goods as part of their job role.

Application of the Unit

Application of the unit	The operator needs to: • complete relevant paperwork • confirm the goods are complete and undamaged • take appropriate action with non-conforming goods and • handle chemicals, dangerous goods and goods which have special requirements regarding handling and storage. It is not intended for people whose major function is to operate a warehouse. Instead use relevant warehousing competency units from the Transport and Distribution Training Package. This competency is also not intended for those handling bulk goods in tank farms where <i>PMAOPS240 Store liquids in bulk</i> should be used. For operations involving bulk particulates, see <i>PMAOPS309 Operate particulates handling storage equipment</i>. This competency does not include the use of forklift trucks, which is instead covered by <i>TDTD1097B Operate a forklift</i>. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Move goods into store.	2.1. Check paperwork and identity of goods 2.2. Check for completeness and damage 2.3. Take action on non-conforming goods/loads 2.4. Unload goods 2.5. Move goods to correct storage location 2.6. Store goods safely.
3. Move goods from store.	3.1. Interpret order/paperwork 3.2. Check and take action on special requirements (e.g., dangerous goods) as required 3.3. Select items to be moved based on age of stock and other requirements 3.4. Move goods from store 3.5. Load goods to procedures.

ELEMENT	PERFORMANCE CRITERIA
4. Complete goods movement records.	4.1. Complete goods movement records (in or out) 4.2. Update stock records as required 4.3. Complete other paperwork and records as required.
5. Respond to goods handling problems.	5.1. Monitor goods movements as appropriate 5.2. Recognise problems and inefficient goods movements 5.3. Analyse cause of movement problems within scope of skill level 5.4. Take timely and appropriate action to solve movement problems.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Required knowledge

Understanding of store processes to a level needed to recognise and resolve non-standard situations to procedures. In particular it includes a knowledge of:

- paperwork related to this competency
- manual handling techniques
- handling and storage requirements of hazardous substances
- hazardous substances regulations
- regulations related to transporting hazardous substances
- duty of care
- materials safety data sheets (MSDSs)
- HAZCHEM symbols and codes
- spill containment and disposal procedures
- procedures related to this competency
- environmental requirements related to waste disposal
- workplace hazards and methods of controlling hazards.

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. As well, competence must be demonstrated in safe handling/storage of goods, including dangerous or hazardous goods. Consistent performance should be demonstrated. In particular look to see that: • all relevant safety requirements are followed, including manual handling and safe handling/storage of hazardous substances • early warning signs of equipment/processes needing attention or with potential problems are recognised

EVIDENCE GUIDE	
	- the range of possible causes can be identified and analysed and the most likely cause determined - appropriate action is taken to ensure a timely return to full performance - obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Also consider co-assessment with units covering: - housekeeping - communication - forklift. In a major hazard facility, it may be appropriate to assess this unit concurrently with: <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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	
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.	
Codes of practice/standards	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 a limited range of goods only, such as might typically be handled by a processing plant store. The goods would typically be packaged, and tasks could include loading or unloading trucks, tanker trucks and semi-bulk containers.
Paperwork/records	The terms 'paperwork' and 'records' mean any and all relevant information and data, whether manual, paper based, electronic or verbal, either relayed in person or by phone/radio/intranet, etc.
Moving goods into store and from store	This competency does not imply that moving goods into store and from store are conducted equally, or even using similar techniques.
Customers	Customers may be internal or external and loading/unloading goods may mean getting them onto/off a truck or simply from/to the next department.
Problems	Typical problems include: • compatibility of goods in loads and in storage • special storage requirements, eg temperature control • special handling requirements, eg fragile, dangerous goods • handling incomplete loads (either in or out) • handling damaged goods, goods with poor/missing labels • incomplete or incorrect paperwork.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.

RANGE STATEMENT	
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS204B Use utilities and services

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the use of a range of utilities and services in the plant. It includes the selection of the appropriate utility/service from those provided to the plant and recognizing and responding to operational problems as required.

Application of the Unit

Application of the unit	In a typical scenario an operator will be able to identify and select utilities and services used on a day to day basis. These will be provided to a process plant and will consist of instrument and plant air, nitrogen, plant water, steam, flushing oil and other utilities/ services required for a particular process. The operator uses these utilities/services as required. The correct use and application of these substances is essential to plant and operator safety and the continued performance of the process. Generally the operations technician would be part of a team during start-up and shutdown procedures and may be expected to be capable of performing all parts of this unit, but only for those utilities/services required by their plant. At all times they would be liaising and cooperating with other members of the team. This unit does not cover the provision or generation of utilities or services which are covered by: • <i>PMAOPS224B Provide fluids for utilities and support, OR</i> • <i>UTPNEG162A Operate and monitor boiler steam/water cycle.</i>

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Select and use utilities and services.	2.1. Identify utilities and services available in the plant 2.2. Identify key properties, applications and limitations of each utility and service 2.3. Select appropriate utility/service for the required duty 2.4. Use selected utility/service to procedures.
3. Respond to problems.	3.1. Monitor use of utility/service frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate. 3.2. Recognise operational problems 3.3. Analyse cause of operational problems within scope of skill level 3.4. Take timely and appropriate action to solve operational problems.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Ability to isolate the causes of problems to an item of equipment within the production system and to distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- variations in product parameters (temperature, flows, pressure and levels).

Required knowledge

Understanding of service utilities which form part of the utilities system. In particular it includes a knowledge of:

- names and functions of all items on a schematic of the utilities system
- differences in use and methods between each service and utility
- hazards in operation of services
- differences between grades/types of services, eg grades of steam, air and nitrogen
- physics and chemistry relevant to the utility and its use
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling utility
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems, such as steam traps, lubricators, moisture pots
- types and causes of futility problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and

EVIDENCE GUIDE	
	analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the communication ability, language and literacy capacity of the assessee and the work being performed.

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

RANGE STATEMENT	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Service utilities	This unit of competency includes all service utilities which form part of the utility system. For your plant this may include (select relevant items): • steam - saturated, superheated • air - process, instrument, breathable • water - cooling, boiler feed, plant, waste • inert atmosphere - nitrogen, carbon dioxide • flushing oil.
Problems	Typical problems for your plant may include: • non-supply of products and elements • variation in product and element feed rates • variations in temperature, pressure and flow • blockages or leakage.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety	All operations to which this unit applies are subject to stringent health,

RANGE STATEMENT**and
environment
(HSE)**

safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMAOPS205B Operate heat exchangers

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency is typically performed by an operator and covers the operation of heat exchangers, including heat exchangers that form part of a heating, cooling or refrigeration system, and solving of heat exchanger problems.

Application of the Unit

Application of the unit	In this competency, an operator would typically start up and shut down heat exchangers in accordance with procedures, and make adjustments to flow rate, temperature and pressure, depending on the type of heat exchanger. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This competency does not cover super heaters or waste heat boilers, which are treated as part of steam generating equipment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Operate heat exchangers.	2.1. Identify the type of heat exchanger 2.2. Start up and shut down heat exchanger according to the heat exchanger type and duty 2.3. Adjust flow rates, temperatures and pressure as appropriate to type of heat exchanger 2.4. Complete routine checks, logs and paperwork, taking action on unexpected readings and trends.
3. Isolate and de-isolate plant.	3.1. Isolate plant 3.2. Make safe for required work 3.3. Check plant is ready to be returned to service 3.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
- efficient and effective operation of plant/equipment - hazard analysis - completing plant records

REQUIRED SKILLS AND KNOWLEDGE

- communication
- problem solving.

Operation of heat exchanger and the ability to recognise and resolve operational problems. This could include any of the following remedial actions:

- making adjustments
- carrying out minor maintenance
- identifying and reporting problems outside operator's scope of responsibility
- identifying and controlling hazards related to heat exchangers and their integral equipment, including pressure vessels.

Required knowledge

Comprehensive understanding of heat exchanger principles to a level needed to control the operation. In particular, the operator needs to understand the factors affecting efficient operation of a heat exchanger in order to make appropriate adjustments or recognise when maintenance is required. These also includes a knowledge of:

- all items on a schematic of the heat exchanger system and the function of each
- principles of operation of heat exchangers
- correct methods of starting, operating and shutting down heat exchangers
- issues related to pressure vessels (regulations, requirements)
- physics and chemistry relevant to the process unit
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- causes of head loss and change in heat transfer coefficient/rates
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems, such as tubes and baffles.

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, the Range Statement and the Assessment Guidelines for the Training Package.

EVIDENCE GUIDE	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of

EVIDENCE GUIDE	
	scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with units covering: • fluid flow • utilities and services • communication. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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	
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.	
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency includes all types of heat exchangers such as: • plate • Utube • spiral • bayonet • air cooled fin • shell and tube (all variants of design) • scraped surface

RANGE STATEMENT	
	vessel jackets/coils. This competency does not cover super heaters or waste heat boilers, as these are treated as part of steam generating equipment.
Heat exchanger duties	Heat exchanger duties include: - heating - cooling - cryogenic - reboilers - condensers - gas dryers - gas coolers - refrigeration (evaporators/condensers).
Problems	Typical problems include: - damage to heat exchanger due to overheating and/or under/over pressurising - factors that affect heat exchanger efficiency (scale build-up, fouling, internal leakage, air lock, turbulence, corrosion) - leakage or gasket problems - recognising when maintenance is required.
Start up shut down as required	Start up shut down as required includes: - start up and shut down to/from normal operating conditions - start up and shut down to/from isolated, cold, empty - all other conditions experienced on the plant. ie from any condition to any condition experienced on the plant.
Appropriate action	Appropriate action includes: - determining problems needing action - determining possible fault causes - rectifying problem using appropriate solution within area of responsibility - following through items initiated until final resolution has occurred - reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: - all work instructions - standard operating procedures - formulas/recipes

RANGE STATEMENT

	• batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMAOPS208B Operate chemical separation equipment

Modification History

Release 2 – Minor clarifications and editorial corrections.

Unit Descriptor

This competency covers the operation of chemical separation equipment where the feed is usually single phase. It covers the range of separation equipment which rely on a phase change or chemical change to enact the separation and includes crystallisers, ion-exchange filters, absorbers and the like.

It also includes solving problems with separation processes and the equipment.

Application of the Unit

In this competency, an operator would typically start up and shut down separation operations in accordance with procedures, and make adjustments to flow rate and pressure, depending on the type of separation equipment.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does not cover stand alone, non-powered dual phase separation equipment or powered dual phase separation equipment (eg centrifuge) which are instead covered by:

PMAOPS246A Operate separation equipment

PMAOPS247A Operate powered separation equipment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

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	Prepare for work	1.1 Identify work requirements
		1.2 Identify and control hazards
		1.3 Coordinate with appropriate personnel
2	Operate chemical separation equipment	2.1 Identify the type of chemical separation equipment
		2.2 Start up and shut down chemical separation equipment according to type and duty
		2.3 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		2.4 Adjust flow and pressure as appropriate to type of separation equipment
		2.5 Complete routine checks, logs and paperwork, taking action on unexpected readings and trends
3	Isolate and de-isolate plant	3.1 Isolate plant
		3.2 Make safe for required work
		3.3 Check plant is ready to be returned to service
		3.4 Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Required knowledge

A comprehensive understanding of separation equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of:

- all items on a schematic of the separator system and the function/s of each
- principles of operation of separation equipment
- factors affecting efficient operation of the separation equipment
- physics of operation, including behaviour of solids, liquids and gases, effects of phase changes, effects of temperature and pressure
- chemistry of operation, including simple chemical reactions, elements, compounds and mixtures
- function and troubleshooting of major internal components and their problems, such as reagents, contaminants, supports, nozzles and grids
- typical problems with separation equipment and their remedy
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling
- corrective action appropriate to the problem cause
- types and causes of problems within operator's scope of skill level and responsibility

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.

Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of

assessment	scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with: • <i>PMAOPS201B Operate fluid flow equipment</i> • <i>MSAPMSUP210A Process and record information.</i> In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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

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.

Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Equipment	Separation equipment covered by this competency includes all types of chemical separation equipment for gaseous, liquid and solids separation duties, where the feed is essentially in a single phase and the separation relies on a change of the material or a chemical process to enact the separation, such as: • crystallisers • ion-exchange filters/columns • precipitators • absorbers/adsorbers
Remedial actions	Remedial actions could include:

- making adjustments (e.g. flow and pressure)
- carrying out minor maintenance within operator's skill level
- identifying and reporting problems outside operator's scope of ability
- identifying and controlling hazards related to chemical separation equipment and surrounding areas

Problems

Typical problems include:

- seal/gasket leaks
- pressure loss/low flow
- cartridge/filter change
- reagent/medium activity
- blockages/build-up
- contaminants

Start up shut down as required

Start up shut down as required includes:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold or empty
- all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)

Appropriate action

Appropriate action includes:

- determining problems needing action
- determining possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility to designated person

Procedures

Procedures may be written, verbal, computer-based or in some other form. They include:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations.

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Operational/technical

Competency field

Not applicable

Co-requisite units

Not applicable

PMAOPS210B Operate particulates handling equipment

Modification History

Release 2 – Minor clarifications and editorial corrections.

Unit Descriptor

This competency covers the operation of the range of equipment used to store and convey particulate solids. This competency is typically performed by many operators in a solids handling plant and is often a starting point for operators to learn the operation of the plant as a whole. It covers items of equipment such as mechanical conveyor systems (including feeders), and/or pneumatic conveyor systems and storage equipment such as hoppers and silos or stockpiles.

Application of the Unit

In this competency the operator would control the conveyor systems transporting particulates into or out of storage (e.g. silos, stockpiles). This means setting up, starting and stopping mechanical or pneumatic conveyor systems and their feeder systems (if any) to convey the materials from one point to another (e.g. between storage units, from storage to packing area). During the process the operator would monitor the operations and take appropriate action to keep particulates moving correctly. This could include removing blockages and preventing rat holing or bridging in hoppers/silos.

This also requires the operator to recognise indications of potential problems with the equipment and to take appropriate and timely remedial action. The operator would carry out minor maintenance according to procedures, or report maintenance requirements outside the operator's level of ability.

The operator would also manage the particulates storage facilities. This includes:

- transferring stock into, out of or between storage units
- making effective use of the available storage capacity
- monitoring the quality, quantity and location of stock
- supplying customers (internal or external) with the correct quality and quantity of stock
- identifying and controlling hazards related to particulates handling equipment and surrounding areas.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Should this be a complex storage facility see PMAOPS309B Operate particulates handling storage equipment.

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	Prepare for work	1.1 Identify work requirements
		1.2 Identify and control hazards
		1.3 Coordinate with appropriate personnel
2	Operate mechanical conveyors and/or feeders as required	2.1 Identify the type of conveyor/feeder
		2.2 Start up and shut down conveyor/feeder according to the conveyor type and duty
		2.3 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		2.4 Complete routine checks, logs and paperwork, taking action on unexpected observations, readings and trends

3	Operate pneumatic/vacuum conveyor as required	3.1 Identify the type of conveyor
		3.2 Start up and shut down conveyor according to conveyor type and duty
		3.3 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate.
		3.4 Complete routine checks, logs and paperwork, taking action on unexpected observations, readings and trends.
4	Operate fan/blower if appropriate	4.1 Identify type of fan/blower
		4.2 Start up and shut down fan/blower according to its type and duty
		4.3 Monitor critical variables, such as amps, temperature or vibration, and recognise trends/patterns which indicate a potential or actual problem with the fan/blower
		4.4 Take appropriate action
5	Transfer particulates	5.1 Check source, destination and route of planned transfer
		5.2 Check quality, quantity and location of stored particulates
		5.3 Transfer particulates into, out of and between storage units as required
		5.4 Supply customers with correct quality and quantity in a timely manner
6	Isolate and de-isolate plant	6.1 Isolate plant
		6.2 Make safe for required work
		6.3 Check plant is ready to be returned to service
		6.4 Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving
- ability to distinguish between:
 - grades and specifications of materials
 - types and causes of conveyor or storage problems to a level that allows problems to be isolated to an item of equipment

Required knowledge

A comprehensive understanding of the equipment and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of particulate properties, such as:

- particle size and shape - reactivity, solubility, colour, health and safety
- angle of repose - storage and transport
- angle of slide - transport
- explosivity - static electricity
- dusts - hazards, good practice.

Also knowledge of:

- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit
- process parameters and limits (e.g. temperature, pressure, flow, pH and amps)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling flow
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems
- types and causes of problems within operator's scope of skill level and responsibility
- density and bulk density
- good operating practices

- methods of resolving problems
- HAZCHEM symbols and codes

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.

Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part

of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Context of and specific resources for assessment

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Method of assessment

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

- *MSAPMSUP210A Process and record information.*

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- *MSAPMOHS200A Work safely.*

Guidance information for assessment

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

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.

Codes of practice/standards

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Equipment

This competency unit includes items of equipment, such as:
mechanical conveyors/feeders (including belt, vibrating, screw and flight; and feeders, such as screw, star, slide, volumetric and weight)
pneumatic conveyors, including aspects, such as dense phase, disperse phase, pressure and vacuum

storage (e.g. silos and hoppers, purging hoppers, and stockpiles)

bulk tankers, transportable containers and intermediate storage

Problems

Typical problems include:

- damage to particulates
- contamination of stored stock
- rat holing and bridging in silos
- routing issues, and so on

Start up shut down as required

Start up shut down as required includes:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold or empty
- all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)

Appropriate action

Appropriate action includes:

- determining problems needing action
- determining possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility to designated person

Procedures

Procedures may be written, verbal, computer-based or in some other form. They include:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations.

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take

precedence.

Unit Sector(s)

Operational/technical

Competency field

Not applicable

Co-requisite units

Not applicable

PMAOPS211B Operate manufacturing extruders

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the operation of extruders which produce plastic granules/pellets from polymer resin and similar extrusions, eg powder coating resin. It includes the operation of equipment ancillary to the extruder, including that used for adding masterbatch and other additives.

Application of the Unit

Application of the unit	In this competency, the operator would operate an extruder and its associated equipment, such as the input and output feeder systems or cooling systems. This includes starting up and shutting down the system, building the extrusion rate up correctly after start up, and then monitoring the system to maintain the required output rate and quality. This requires the operator to have a good understanding of the effect of adjustments (eg barrel temperature) on the extrusion process. The operator would make appropriate adjustments as required to ensure the product quality meets specifications, output meets schedule and to minimise potential problems with the process. In this competency, the operator would: • make changes to the extruder system such as change the production rate or change the specifications of the output product • perform cleaning and minor maintenance on the extruder system in accordance with procedures • identify and control hazards related to manufacturing extruders and surrounding areas. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Start up extruder systems.	1.1. Perform pre-start-up checks 1.2. Start up individual items of equipment, and the entire extrusion system 1.3. Start up system after maintenance 1.4. Build up extrusion rate steadily 1.5. Produce output at specified rate and quality within minimum time.
2. Monitor and control the extrusion process.	2.1. Complete routine checks, logs and paperwork 2.2. Inspect pellet/granule properties, and recognise and correct problems 2.3. Monitor stock levels of feeds and products and take action to maintain production schedule and quality 2.4. Adjust plant to achieve required output rate and

ELEMENT	PERFORMANCE CRITERIA
	quality with maximum plant efficiency.
3. Change production rates and/or product grade/specification.	3.1. Predict from rates and schedule when a transition will be required 3.2. Manage transitions smoothly and in a timely manner 3.3. Minimise scrap/off grade as a result of a transition.
4. Carry out maintenance procedures	4.1. Isolate extrusion equipment and prepare for maintenance as required 4.2. Test safety trips and alarms 4.3. Complete minor maintenance according to procedures 4.4. Receive plant back from maintenance 4.5. Prepare plant for the introduction of polymer and additives 4.6. Return plant to operation.
5. Shut down extrusion systems.	5.1. Determine type of shut down required 5.2. Give advance warning of shut down where appropriate 5.3. Change over individual items of equipment 5.4. Shut down individual items of equipment and the entire extrusion system 5.5. Perform an emergency shut down when required 5.6. Reset trips and alarms after a shut down and leave plant in a condition ready to restart 5.7. Shut down for maintenance when required.
6. Clean extruder.	6.1. Identify cleaning requirements 6.2. Clean extrusion equipment to requirements according to procedures.
7. Control hazards.	7.1. Identify hazards in work area and with equipment 7.2. Assess risks arising from those hazards 7.3. Take appropriate action to control risks in accordance with procedures and duty of care.
8. Respond to extruder problems.	8.1. Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing etc) as appropriate. 8.2. Recognise operational problems 8.3. Analyse cause of operational problems within scope of skill level 8.4. Take timely and appropriate action to solve

ELEMENT	PERFORMANCE CRITERIA
	operational problems.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
The ability to distinguish between types and causes of problems as relevant to the practical operation of equipment at the job level.
Required knowledge
A comprehensive understanding of extrusion equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of: • all items on a schematic of the extruder and the function of each • principles of operation of equipment • physics of operation, including effects of temperature and pressure • properties of materials being extruded • temperature and viscosity effects • isolating a problem to an item of equipment • methods of resolving problems. This knowledge is required of all major items of equipment which comprise the extrusion system.

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the

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	assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency (eg Elements 3 and 4). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources	Assessment will require access to an operating plant over an extended period of time, or a suitable method of

EVIDENCE GUIDE	
for assessment	gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with: • <i>PMAOPS210B Operate particulates processing equipment</i> • <i>MSAPMSUP210A Process and record information.</i> In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the communication ability, language and literacy capacity of the assessee and the work being performed.

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.	
Codes of practice/standards	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 all items of equipment and unit operations which form part of the extrusion system. Typically this will include: • additive (including masterbatch) systems • granule/pellet cutting and cooling systems • barrel/head heating and cooling systems.

RANGE STATEMENT	
Problems	It could also include other equipment as well as the extruder itself. It includes the operation of equipment ancillary to the extruder, including that used for adding masterbatch and other additives. Typical problems include: • knife/blade/cutter adjustment • screen pack preparation and changes • granule/pellet properties not to specification • granule/pellet cooling systems etc.
Procedures	All operations are performed in accordance with procedures.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS213B Package product/material

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency is typically performed by operators and covers the operation of a packing line to package materials and products. Typical packing lines included in this competency may dispense liquid products into drums or plastic containers, pack filled containers into cartons or stack filled containers onto pallets.

Application of the Unit

Application of the unit	In this competency, the operator would use documentation to determine the packaging requirements, then select and prepare the required materials. Once all requirements are established, the operator would then set up the packing line and any ancillary equipment After checking that the packing line is ready for operation (free of blockages, contamination, etc), the operator would start the line to procedures and monitor its operation during the packaging process. This would include checking that the packaged product complies with specifications and completing relevant documentation. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Isolate and de-isolate plant.	1.1. Isolate plant 1.2. Make safe for required work 1.3. Check plant is ready to be returned to service 1.4. Prepare plant for return to service.
2. Prepare equipment and materials for packaging.	2.1. Identify from documentation the type, quantity and quality of product to be packed 2.2. Identify the range of packaging materials and ancillaries and their specific functions 2.3. Insure packaging materials are available in accordance with documentation 2.4. Select and prepare packaging materials according to compatibility with content, to procedures 2.5. Check packaging materials for correct labels/safety information.
3. Set up line.	3.1. Select appropriate measuring equipment 3.2. Select and fit appropriate dispensing equipment 3.3. Check all parts of line for damage, contamination or blockage 3.4. Clean equipment as required 3.5. Set up line for required quantity of product and labels to procedures 3.6. Start up and shut down line.

ELEMENT	PERFORMANCE CRITERIA
4. Package product	4.1.Fill package 4.2.Check that packaged product complies with specifications 4.3.Report as required.
5. Control hazards.	5.1.Identify hazards in work area and with equipment 5.2.Assess risks arising from those hazards 5.3.Take appropriate action to control risks to procedures and duty of care.
6. Respond to packaging plant/process problems.	6.1.Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing etc) as appropriate. 6.2.Recognise operational problems 6.3.Analyse cause of operational problems within scope of skill level 6.4.Take timely and appropriate action to solve operational problems.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Required knowledge

A comprehensive understanding of extrusion equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of:

- OHS and legislative requirements relating to safe manual handling/lifting,
- OHS and legislative requirements relating to dangerous goods
- HAZCHEM and labelling requirements
- materials safety data sheets (MSDSs)
- compatibility of packaging materials with content

REQUIRED SKILLS AND KNOWLEDGE

- effect of temperature and pressure on properties of substances
- effects and hazards caused by static electricity (where relevant)
- typical packaging problems, such as the effects of static electricity on the packaging process, including potential hazards with flammable liquids
- methods of resolving problems.
- principles of operation of plant/equipment
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling packer
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk- throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of

EVIDENCE GUIDE	
	knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

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	<i>PMAOPS203B Handle goods.</i> In a major hazard facility, it may be appropriate to assess this unit concurrently with: <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit includes all items of equipment and operations which form part of the packaging process. Typically this will include indicative functions such as: - packaging - labelling - palletising - storing - verification of product type, quantity and quality - calculation of actual packaged product against documentation.
Ancillary equipment	This includes labeler, measuring equipment, palletiser, dispensing equipment
Packaged products	Packaged products include: - liquids (such as paint, detergents, chemicals) - solids (powders and pellets) - gases (and liquified gases).

RANGE STATEMENT	
Packaging	Packaging includes: • tins, cans • drums • bags and sacks • semi-bulk (such as bulker boxes and pallets) • gas cylinders or drums.
Resources	It could also include resources such as: • labelling equipment • packaging materials • documentation • lifting/transporting equipment.
Start up shut down as required	Start up shut down as required includes: • start up and shut down to/from normal operating conditions • start up and shut down to/from isolated, cold, empty • all other conditions experienced on the plant. ie from any condition to any condition experienced on the plant.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through

RANGE STATEMENT

environment (HSE)	State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS216B Operate local control system

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the operation of a local control panel. These controllers use simple control algorithms and only a limited number of control loops. Typically it will be located on the plant, but may also be located off plant and include simple panels in a control room which are not part of the main control panel.

Application of the Unit

Application of the unit	In a typical scenario, the operator will use the local control panel to monitor and control process variables such as temperature or pressure and the operation of valves and pumps to add raw materials, additives, and discharge product. Routine start up and shut down of the equipment using the local control system is expected, as is emergency response and shut down. This includes but is not restricted to PLC control. This includes an understanding of the process and all OHS requirements including emergency situations. The unit does not apply to operating a control panel for an integrated plant, where the control is from a separate control room or control system, which is covered by PMAOPS305B Operate process control systems. The plant technician would: • be aware of and contribute to a safe working environment • identify and report operational problems to their supervisor / control room operator • execute all routine activities, including process monitoring, start up, shut down and adjustments, in accordance with position description. Generally the operator would operate independently in the plant. The operator would be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Interface with the control panel	2.1. Monitor the process using the operator interfaces and keep appropriate personnel informed on developments 2.2. Select appropriate controller modes to ensure the effective control of the process 2.3. Undertake required set point/output changes to optimise plant and process requirements 2.4. Access historical data and information 2.5. Acknowledge messages and alarms.
3. Control the process using the local control system	3.1. Obtain relevant data and information from the control system by applying systems knowledge

ELEMENT	PERFORMANCE CRITERIA
	3.2. Identify the status of individual pieces of equipment from the control panel and use information to identify potential faults 3.3. Interpret alarms and prioritise steps to ensure control of system is maintained 3.4. Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics 3.5. Make required set point/output changes to meet plant and process requirements 3.6. Take other appropriate action as required 3.7. Record process variations/irregularities in accordance with procedures.
4. Facilitate planned and unplanned process start-ups and shutdowns	4.1. Respond to all alarms and take appropriate action 4.2. Maintain coordination with all outside services and operations in order to assist in the correct identification and reporting of faults 4.3. Conduct planned start-up and shutdown processes to procedures 4.4. Conduct unplanned start-up and shutdown processes to procedures 4.5. Communicate with all operational areas and personnel affected by unplanned events to ensure safety is maintained during the process 4.6. Implement all required and stated emergency responses and ensure the outcomes of these responses are communicated to all affected areas 4.7. Log all required information for further action to provide a historical record of all events.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to distinguish between causes of problems/alarms/fault indications such as:

REQUIRED SKILLS AND KNOWLEDGE

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies
- product parameters (temperature, flows, pressure and levels).
- An ability to communicate with other work groups and personnel during the operation and monitoring of this equipment is considered an essential element of this unit of competency.

Required knowledge

Competence includes an understanding of underpinning knowledge. Demonstration of competence in this unit must include knowledge of:

- all items on a schematic of the controller and the function of each
- principles of operation and location of the process/production equipment
- specific plant process operations
- product specifications and tolerances
- systems operating parameters
- basis of control for the process
- emergency shutdown procedures
- process specific physics, chemistry and mathematics
- process drawings, eg P&ID, PFD, cause and effect
- instrumentation and control systems, eg relevant primary sensing devices, final control elements, transducers/transmitters
- simple control loops, including PID control, set points, controlled variable, indicated variable
- effective communication techniques.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on a local control system. Assessment of this unit should demonstrate competence on actual plant and equipment in a work environment. The unit will be assessed in as

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	holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual process control system and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. This unit of competency requires a significant body of knowledge, which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responses. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and

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	similar sources.
Context of and specific resources for assessment	Assessment will require access to a process control system over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions, which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with appropriate operations competencies for the unit of plant. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAOHS200A Work safely</i>
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations, which form part of the production/processing system. For your local control system this may include (select relevant items): • plant items requiring only simple control

RANGE STATEMENT	
	• programmable logic controllers (PLCs) • hard wired control and alarm panels • analogue control systems • personal computers • printers • fire and gas detection/protection systems • emergency shutdown systems • communications systems. Typical problems for your plant may include: • variation/loss of feed • unstable control of pressure, temperature level and flows • control equipment failure • process plant trips • change in atmospheric conditions (rain, temperature, wind, lightning) • emergency situations • loss of power/utilities.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS217B Operate wet milling equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the operation of wet milling equipment as found in plants manufacturing paint and other materials. It includes starting up and monitoring the performance of the equipment under supervision, and shutting down the equipment in an emergency, if instructed to do so. The wet milling equipment may be vertical or horizontal mills, and may incorporate rolls, balls or beads as the milling medium.

Application of the Unit

Application of the unit	The operator would: • be aware of and contribute to a safe working environment • identify and report operational problems to their supervisor/control room operator • contribute to plant optimisation • execute all routine activities including process monitoring, sampling, planning and maintenance (in accordance with position description). Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Start up mill.	2.1. Perform pre-start-up checks 2.2. Liaise with other team members and control room operator on the intended function 2.3. Confirm raw materials are available and correct 2.4. Prepare pre-mixer and introduce raw materials to pre-mixer (if required) 2.5. Start up the mill as needed 2.6. Build operating rate steadily, checking expected performance criteria at various stages 2.7. Bring to specified conditions within specified time.
3. Monitor milling operation.	3.1. Monitor and observe mill operating condition, pressures and temperatures 3.2. Recognise observations which differ from normal operating parameters and requirements

ELEMENT	PERFORMANCE CRITERIA
	3.3. Take appropriate action to maintain correct operating parameters 3.4. Identify faults and initiate repair or report as required 3.5. Monitor life of beads (if applicable) and/or condition of rollers/balls (if applicable).
4. Shut down and start up milling equipment.	4.1. Determine type of shutdown required 4.2. Check for related work or other affected plant to allow for coordination of activities and give advance warning where possible 4.3. Check and satisfy all permit requirements before equipment is brought back on line 4.4. Monitor and report equipment performance to control operations 4.5. Complete logs recording the details of the work conducted to provide a historical record of the equipment operation.
5. Isolate and de-isolate plant.	5.1. Isolate plant 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.
- Ability to distinguish between causes of problems/alarms/fault indications such as:
- equipment malfunction, including consequences and potential for escalation
- plant not performing to design
- bead life, roller/ball wear or adjustment (as applicable).

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Demonstration of competence in this unit must include knowledge of:

- all items on a schematic of the mill system and the function/s of each
- principles of milling equipment operation
- process and product variables
- bead life (if beads are used in process).
- physics and chemistry relevant to the process unit
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling mill
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations that will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

EVIDENCE GUIDE	
	This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution • pre-start checks are made to ensure equipment is lined up to the plant in accordance with procedures and/or manufacturers specifications These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

EVIDENCE GUIDE	
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes various types of wet milling equipment (select the types relevant to your plant): • vertical • horizontal • bead mills • roll/ball-type mills.
Ancillary equipment	This unit also covers ancillary equipment which form part of the wet milling system. For your plant this may include (select relevant items): • pre-mix vessels • coolers, cooling jackets and heat exchangers • pumps • vessels, tanks • piping systems • valves and flanges • sumps and drains.
Problems	Typical problems for your plant may include:

RANGE STATEMENT	
	• condition and life of beads (if applicable) • condition of rollers/balls (if applicable) • cooling system fouling • blocked filters or piping • high/low levels • loss of process cooling resulting in high process temperatures • equipment failure or shutdown resulting in loss of feed to process • excess/unexpected sand production • composition changes.
Start up shut down as required	Start up shut down as required includes: • start up and shut down to/from normal operating conditions • start up and shut down to/from isolated, cold, empty • all other conditions experienced on the plant. ie from any condition to any condition experienced on the plant.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS220B Monitor chemical reactions in the process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers an operator looking after a production process which includes a chemical reaction. The vessel in which this reaction is occurring may be a purpose built 'kettle' or other reaction vessel, or it may simply be a stirred tank in which a reaction is occurring. Processes may be batch or continuous.

Application of the Unit

Application of the unit	The reaction is not just incidental to the operation (eg where the reaction is simply dissolution or dissociation; in which case <i>PMAOPS202 Operate fluid mixing equipment</i> would be appropriate). The reaction, which itself may be simple, is a key step in the process, and the operator needs to monitor and control this reaction in order to produce the desired product. The reaction may, or may not, include the use of catalyst (either homogeneous or heterogeneous phase). The reactor or reaction vessel includes types of vessels such as: • kettles • stirred tanks. The operator would: • identify and rectify operational problems • monitor the reactor operation, making adjustments as directed or to procedure • adjust product properties as directed or to procedure. This reactor and its control would be relatively simple, operated in a stand alone manner and typically might be found in a small batch plant, although appropriate examples might also exist in larger plants. For more complex reactions/reactors see <i>PMAOPS302B Operate reactors and reaction equipment</i>. It is expected that the operator would usually be liaising and cooperating with other members of the shift. The operator might also need to be competent in operating a control panel -

	see appropriate control unit

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare reactor.	2.1. Perform preliminary checks 2.2. Charge materials as required by procedures 2.3. Bring the reactor contents to the specified conditions steadily and within specified time frame.
3. Monitor and control the reaction process.	3.1. Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing,

ELEMENT	PERFORMANCE CRITERIA
	etc) as appropriate. 3.2. Take appropriate action 3.3. Discharge vessel as required 3.4. Clean vessel and prepare for next batch/product 3.5. Complete required reports.
4. Isolate and de-isolate plant.	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- reading recipe/formula sheets
- weighing, measuring, controlling the addition of reactants and other materials
- monitoring and controlling reaction conditions.

Required knowledge

Competence includes an understanding of the reactions and equipment integral to the operation of the reactor to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the reactor and describe the function of each
- distinguish between elements, compounds and mixtures in raw materials and products
- describe the nature/condition of materials at each stage of the reaction, the changes which have occurred in that stage and why they have occurred
- describe reactions in chemical terms, including the effect of changing reaction variables such as temperature, concentration, pH
- describe the reaction using basic chemical equations
- state the type of reactor(s) used and its/their characteristic/s
- describe the methods of controlling the reaction, including rate and yield
- describe the causes and remedies of common problems such as those selected in the Range Statement.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the reaction system and to distinguish between causes of problems/alarm/fault

REQUIRED SKILLS AND KNOWLEDGE

indications such as:

- raw materials variations
- instrument failure/wrong reading
- equipment failure (electrical/mechanical)
- mechanical failure
- operational problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

EVIDENCE GUIDE	
	Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It will frequently also be appropriate to assess this unit concurrently with units dealing with: • measurements and readings • housekeeping • preparing materials • fluid mixing • heat exchange • using computers • packaging • local control system.

EVIDENCE GUIDE	
Guidance information for assessment	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	
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.	
Codes of practice/ standards	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 all minor items of equipment which are integral to the reaction process.
Typical problems	Typical problems include: • variations in material composition • variation in ambient conditions • control of reaction temperature • adjustments to meet product specifications. All operations are performed in accordance with procedures.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria

RANGE STATEMENT

	and HSE requirements, the HSE requirements take precedence. Operators should be able to determine safe working practice using the relevant materials safety data sheets.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMAOPS221B Operate and monitor prime movers

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the operation of a prime mover and its ancillary equipment is used to drive a high pressure pump or compressor. The prime mover may be a large high voltage/current electrical motor, a turbine or a diesel engine. It is a complex, independent item of equipment with a specialised start up and shut down procedure. It may have its own control panel and inbuilt vibration monitoring equipment.

Application of the Unit

Application of the unit	Often the operation of a prime mover will require a 'ticket' (special licence) to operate and local requirements need to be checked. This unit includes starting up/shutting down and monitoring the performance of the equipment and a full understanding of HSE requirements including emergency situations. The operations technician would: • identify and report operational problems • be aware of and contribute to a safe working environment • contribute to the safe and productive operation of the prime mover • monitor, shut down and start up prime mover and ancillary equipment using relevant procedures. This unit does not apply to close coupled motors which are operated as part of the equipment, eg for pump motors see <i>PMAOPS201B Operate fluid flow equipment</i>. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare equipment for operation.	2.1. Check operation and function of prime movers by applying principles of operation and procedures 2.2. Check the operational area to ensure that any potential hazards which may affect the operation of the equipment are removed 2.3. Conduct required safety checks and pre-starts to determine or verify the operational condition of the equipment.
3. Start up prime movers.	3.1. Commission and bring on line prime mover protection devices and ancillary equipment as required by start-up 3.2. Start up prime mover according to procedures.

ELEMENT	PERFORMANCE CRITERIA
4. Monitor and assess prime mover systems.	4.1. Monitor fuel, energy systems and flows as required for prime mover use 4.2. Ensure adequate supplies of clean air at the stated rate or temperature are delivered to the prime mover to allow for successful operation to be achieved 4.3. Monitor lubrication systems to verify that operational parts are functioning efficiently and effectively, and to ensure that all moving parts are operating in a friction free and clean environment 4.4. Monitor and adjust cooling systems to allow for the most efficient operating temperature to be maintained throughout all operating conditions 4.5. Monitor governing systems to allow correct operational speeds of equipment to be maintained and regulated. 4.6. Take appropriate action as a result of monitoring observations.
5. Monitor operational maintenance requirements.	5.1. Conduct routine inspections and checks to ensure normal or stated prime mover operation is maintained 5.2. Identify equipment faults through observation of the operational equipment and periodic sampling and testing 5.3. Take appropriate action on items found 5.4. Record operational data to provide a historical record of the operating condition of equipment.
6. Isolate and de-isolate plant.	6.1. Isolate plant 6.2. Make safe for required work 6.3. Check plant is ready to be returned to service 6.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication

REQUIRED SKILLS AND KNOWLEDGE

- problem solving.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- all items on a schematic of the prime mover and the function of each
- prime mover operating parameters and capacities
- prime mover operating principles, including fuel injection, lubrication, cooling, ignition, induction and exhaust power supply
- equipment operation, including flows, pressures temperatures and speeds
- equipment terminology
- sampling and testing techniques
- process drawings, eg PID, PFS
- cause and effect
- safety systems and procedures
- job hazard analysis.
- physics and chemistry relevant to the prime mover
- process parameters and limits, eg temperature, pressure, flow
- duty of care obligations
- hierarchy of control
- communication protocols eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling flow
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the

EVIDENCE GUIDE

	assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit requires an application of the knowledge contained in the use of the prime movers and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable

EVIDENCE GUIDE	
	situations, which may have been generated from the past incident history of the prime mover, incidents on similar prime movers around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	As a general rule assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. For your plant this may include (select relevant items): • diesel, gas and petrol reciprocating engines • turbine engines • electric motors • governing systems

RANGE STATEMENT	
	• power supply • safety and shutdown systems • cooling systems.
Problems	Typical problems for your plant may include: • variation in power/fuel supply • vibration • overheating • fouling of turbine/engine/exchangers • lubrication quality • ancillary equipment failures. • prime mover failure or malfunction • electrical failure or malfunction • mechanical failure/malfunction • equipment design deficiencies • quality measurement inaccuracy, eg analyzer, manual sampling deficiencies • fuel quality.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any

RANGE STATEMENT

(HSE)	time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS222B Operate and monitor pumping systems and equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario a prime mover is used to drive a complete pumping system including pumps and ancillary equipment (eg, vibration monitors, lubrication pumps and equipment, gear boxes and barring gear). The pumps covered by this unit typically are used for hydrocarbon transmission lines.

Application of the Unit

Application of the unit	The operations technician would: • identify and report operational problems • be aware of and contribute to a safe working environment • contribute to the safe and productive operation of the pump • monitor, shut down and start up pump and ancillary equipment using relevant procedures. This unit only applies to pumping systems and equipment which are driven by prime movers and does not include systems with close coupled motors (see <i>PMAOPS201B Operate fluid flow equipment</i>). This unit includes starting up/shutting down the system and monitoring the performance of the equipment including responding to the requirements of emergency situations Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare equipment for operation	2.1. Check operation and function of pump and driver by applying principles of operation and procedures 2.2. Check the operational area to ensure that any potential hazards which may affect the operation of the equipment are removed 2.3. Conduct pre-start-up checks on the driver and pump to ensure that all nominated operational valves are correctly sequenced before commencing pumping operations, and that all safety requirements are met.
3. Start up/shut down pump.	3.1. Commission pump protection devices and ancillary equipment in accordance with procedures. 3.2. Start up prime mover to procedures 3.3. Bring pump on line

ELEMENT	PERFORMANCE CRITERIA
	3.4. Shut down pump as required 3.5. Perform emergency shut down when required.
4. Monitor and assess pumping systems and equipment.	4.1. Verify the operational condition of all flanges, gaskets and seals to ensure that the operational integrity of these components is maintained within stated operational tolerances and to avoid any environmental damage 4.2. Monitor pumping installations/equipment to determine if the correct pump pressures, temperatures and flows conform to their required application 4.3. Monitor and regularly check pumping systems/ equipment performance and all components to identify any signs of excessive wear and diminution of performance 4.4. Check operational valves and valve assemblies for possible leakages 4.5. Monitor and identify variations in the operating conditions of the pumping systems/equipment through the interpretation of amperage operating data and equipment 4.6. Periodically check and clean filter systems to remove any potential blockages or impurities entering the pumping system/equipment and causing it to cavitate or malfunction during operation 4.7. Inspect and sample lubrication oil to check that operating levels are correct and to determine if any contamination has taken place which may affect the operational capacity of the pumping system/equipment. 4.8. Take appropriate action resulting from checks and monitoring.
5. Identify maintenance requirements.	5.1. Conduct routine inspections and checks to ensure normal or stated pump operation is maintained 5.2. Identify equipment faults through observation of the operational equipment and periodic sampling and testing 5.3. Take appropriate action 5.4. Record operational data as required by procedures.
6. Isolate and de-isolate plant.	6.1. Isolate plant 6.2. Make safe for required work 6.3. Check plant is ready to be returned to service 6.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to and be able to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure malfunction
- electrical failure malfunction
- mechanical failure malfunction
- equipment design deficiencies
- product parameters (temperature, viscosity, purity)
- fouling or contamination, eg filters, exchangers, seal system, lubrication
- cavitation
- overheating (bearings, casing etc)
- overload.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- all items on a schematic of the pump system and the function of each
- pumping system/equipment operating parameters
- sampling and testing techniques
- equipment terminology
- plant or field layout or geography
- safety systems and procedures
- fault finding and troubleshooting techniques
- job hazard analysis.
- principles of operation of pump, ancillaries and components
- physics and chemistry relevant to the pump, ancillaries and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of pumps and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: early warning signs of equipment/processes needing attention or with potential problems are

EVIDENCE GUIDE	
	recognised - the range of possible causes can be identified and analysed and the most likely cause determined - appropriate action is taken to ensure a timely return to full performance - obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of pump, incidents on similar pumps around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	As a general rule assessment will require access to an operating an operating pump system over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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
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

RANGE STATEMENT	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the pumping system. For your plant this may include (select relevant items): • beam pumps • electrical submersible pumps • jet pumps • centrifugal pumps • positive displacement pumps, eg reciprocating pumps • various drivers (diesel engine, electric motor, steam turbine etc) • instrumentation • filters.
Typical problems	Typical problems for your plant may include: • variation in feed • vibration • control of level, temperature, pressure and flow • blockages • overheating • overloading.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units	PMAOPS221B	<i>Operate and monitor prime movers</i>

PMAOPS223B Operate and monitor valve systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario an operator adjusts and monitors valves and ancillary equipment as part of controlling a process, eg hydrocarbons transport pipeline, gas distribution network.

Application of the Unit

Application of the unit	This unit may be required when <i>PMAOPS222B Operate and monitor pumping systems and equipment</i> is appropriate. It may only be counted towards a qualification where competence in <i>PMAOPS201B Operate fluid flow equipment</i> is unable to be obtained due to the nature of the job, but the operation of valves is relevant. The operations technician would: • identify and report operational problems • be aware of and contribute to a safe working environment • contribute to the safe and productive operation of the valve • operate, monitor and maintain equipment using relevant procedures Generally the operator would be part of a team and would be expected to be competent in all parts of this unit. At all times they would be liaising and cooperating with other members of the team/shift.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare valves for operation.	2.1. Check operation of valves and valve systems by applying knowledge of valve operation and fundamental operating principles 2.2. Check the valves required for operation against the site specific operating pressures, temperatures, volume, velocities and materials requirements where applicable 2.3. Prepare or sequence valves required for operation, ensuring that they are either closed or opened as required, to regulate the flow of liquids and systems flow rates in a safe and efficient manner 2.4. Check the valve operational integrity to minimise the risk of valve leakages and failures.
3. Operate valve systems.	3.1. Monitor valve operation to ensure it is functioning correctly and excludes such incidents as vibration, chatter, cycling, and sticking 3.2. Take appropriate action 3.3. Regulate or alter valve sequences to control the flow rates of fluid during the process to meet changing production conditions and demands.
4. Conduct operational maintenance	4.1. Clean and lubricate valve stems, threads and other operational parts to ensure the correct operational condition of the valve is maintained 4.2. Evenly tighten valve bolting assemblies to prevent product

ELEMENT	PERFORMANCE CRITERIA
	leakage 4.3. Identify valve and regulator faults and take appropriate action 4.4. Isolate jammed or sticking valves from operation, and take appropriate action.
5. Isolate and de-isolate valves.	5.1. Isolate plant 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the valve system and distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies, eg wrong valve type for service
- product parameters, eg temperature, viscosity, purity
- fouling or contamination
- erosion and corrosion.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- identify all items on a schematic of the valve system and describe the function of each
- physics related to the process
- valve equipment operating parameters
- process and product variables and reactions
- operating pressures
- operating temperatures
- flow volume calculations
- flow velocity calculations
- fluid corrosive properties

REQUIRED SKILLS AND KNOWLEDGE

- fluid erosive properties.
- principles of operation of valves
- physics and chemistry relevant to the valves and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of, operating and controlling valves
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of valve systems and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use

EVIDENCE GUIDE	
	of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of valves, incidents with similar valves around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	As a general rule assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It will frequently also be appropriate to assess this unit concurrently with: • <i>PMAOPS221B Operate and monitor pumping systems and equipment</i>
Guidance information for assessment	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

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 if the candidate, accessibility of the item, and local industry and regional contexts.

Codes of practice/ standards

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit of competency includes all such items of equipment and unit operations which form part of the valve system. For your plant this may include (select relevant items):

- globe, butterfly, ball and gate valves
- control valves
- isolation valves
- non-return or check valves
- pressure relief valves
- shutdown systems
- hydraulic power units.

Valve actuation may be:

- pneumatic
- hydraulic
- electrical
- manual.

Typical problems

Typical problems for your plant may include:

- vibration/resonance
- blockages/hydrates
- valve seat wear
- valve seal leakage
- valve stem leakage
- mechanical failure, eg plug/gate
- valve sticking.

Appropriate action

Appropriate action includes:

- determining problems needing action
- determining possible fault causes

RANGE STATEMENT	
	• rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS224B Provide fluids for utilities and support

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the generation, provision or 'making' of services for use by a plant. While this generally would apply to a remote or off shore plant, it may also be appropriate for other plants.

Application of the Unit

Application of the unit	In a typical scenario an operator uses and monitors a range of equipment which provides essential fluids for process support. These fluids may be used for instrumentation, cooling, stabilising, scrubbing and hazard reduction, fire suppression and other uses. The operator would: • identify and report operational problems • be aware of and contribute to a safe working environment • contribute to the safe production of utility and support fluids • operate, monitor and maintain equipment following relevant procedures. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit for the services relevant to their plant. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel. This unit does not cover the generation of steam using a fired boiler - see <i>UTPNEG162A Operate and monitor boiler steam/water cycle</i> nor the use of these services as part of operating a process plant - see <i>PMAOPS204B Use utilities and services</i>

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Start up equipment and/or processes.	2.1. Ensure equipment or process is ready to start and not tagged out or subject to work order 2.2. Check all valves, inlets and outlets are in correct positions for start-up 2.3. Check as appropriate for 'clear board' with all indicators 'in the green' 2.4. Inform other plant personnel as appropriate 2.5. Commence start-up to procedures and monitor fluid flows, temperatures and/or pressures 2.6. Confirm all fluids are flowing at correct volume, pressure

ELEMENT	PERFORMANCE CRITERIA
	and/or temperature.
3. Monitor utility and support fluid equipment.	3.1. Determine the required levels of demand for support or utility fluids from a knowledge of the plant/site's process control systems or equipment 3.2. Monitor process equipment and systems, including compressors, pumps, receivers and distribution systems, to meet and maintain the facility utility service requirements 3.3. Monitor and manually adjust flow or ensure correct operation of automatic control valves to control the flow of fluids into the plant/site's process systems and equipment 3.4. Monitor quality of fluids and ensure that they remain within specifications, eg quality and consistency 3.5. Complete routine checks and reports 3.6. Take appropriate action resulting from monitoring and checks.
4. Identify need for maintenance.	4.1. Monitor service records to assist with programmed maintenance scheduling 4.2. Monitor equipment for evidence of maintenance needs outside programmed maintenance 4.3. Advise other site personnel of the need to take equipment off-line for maintenance action 4.4. Identify back-up or auxiliary equipment (where provided) to facilitate maintenance of fluid supplies within the facility 4.5. Ensure equipment can be safely taken off line for maintenance
5. Isolate and de-isolate plant.	5.1. Isolate plant 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare plant for return to service.
6. Respond to emergencies.	6.1. Identify critical out of specification performance of equipment and contact appropriate personnel 6.2. Respond to an emergent situation according to procedures 6.3. Shut down, under instruction, any equipment and associated equipment affected by the emergency situation 6.4. Implement any back-up procedures to ensure the ongoing supply of critical fluids to the remainder of the facility 6.5. Ensure all safety procedures are fully complied with.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the production system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- product parameters (temperature, flows, pressure and levels).

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- identify all items on a schematic of the system and describe the function of each
- principles of equipment operation
- physics relating to the particular process
- chemistry relating to the process
- process equipment operating parameters
- emergency back up systems
- process control systems and instrumentation
- the differences between high pressure and low pressure systems.
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

Evidence Guide

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are

EVIDENCE GUIDE	
	recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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	
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.	
Codes of	Where reference is made to industry codes of practice, and/or

RANGE STATEMENT	
practice/ standards	Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the utilities/fluids supply system. For your plant this may include (select relevant items): • plant water equipment • high and low pressure steam equipment • flushing oil systems • cryogenic plants • refrigerant systems • filtration equipment • purge systems.
Typical problems	Typical problems for your plant may include: • variation in fluid feed • vibration or surging • control of level, temperature, pressure and flow • blockages or leakage.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any

RANGE STATEMENT

(HSE)	time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS230B Monitor, operate and maintain pipeline stations and equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, an operator is responsible for the operation and monitoring of pipeline stations and associated equipment within the parameters established. The competence includes examining the station and its equipment for signs of damage and/or need of maintenance, maintaining general cleanliness and reporting against specific requirements. Pipeline stations can include: • maintenance bases • compressor stations • scraper stations • inlet and delivery stations • mainline block valve sites.

Application of the Unit

Application of the unit	The operator would: • identify and rectify operational problems • monitor station operating parameters • maintain station equipment. Generally the operator would work on an individual basis and be expected to be capable of performing all parts of this unit, but may be part of a team. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel, however, it can be applied to a pipeline control centre if applicable. AS 2885 Part 3 forms the principle reference standard for this competency.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Plan and organise for activities.	2.1. Review previous reports and check for outstanding work orders or notices 2.2. Obtain tools, equipment and testing devices needed to carry out the work and check for correct operation and safety 2.3. Check operational area to ensure that hazards are controlled 2.4. Conduct required safety checks and pre-start checks of the equipment 2.5. Determine status of the system through communication with relevant personnel prior to commencing start-up.
3. Start up/shut down the system.	3.1. Start up the system in accordance with procedures 3.2. Shutdown in accordance with procedures and conditions 3.3. Apply emergency shutdown procedures when appropriate 3.4. Maintain records/reports to procedures.
4. Monitor the	4.1. Monitor operating conditions of equipment through condition

ELEMENT	PERFORMANCE CRITERIA
system	monitoring systems, gauge levels, temperatures and flow indicators in order to determine performance of equipment and system 4.2. Adjust systems for the most efficient operation 4.3. Identify equipment faults through inspection and testing of the operational equipment 4.4. Take appropriate action 4.5. Communicate pipeline system information to relevant personnel 4.6. Select and apply emergency response when required
5. Isolate and de-isolate plant.	5.1. Isolate plant 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare plant for return to service.
6. Record and report results.	6.1. Document and record maintenance results to procedures 6.2. Notify work completion to procedures 6.3. Cancel where appropriate permit to work and sign off at completion of repair.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills Competence includes the ability to isolate the causes of problems to an item of equipment within the pipeline system and to distinguish between causes of problems/alarm/fault indications such as: • process gas variations • instrument failure/wrong reading • electrical failure • mechanical failure • operational problems.
Required knowledge The knowledge referred to in the Evidence Guide for this unit includes: • station instrumentation

REQUIRED SKILLS AND KNOWLEDGE

- condition monitoring equipment
- station power supplies
- operations of metering equipment
- functions of process control equipment
- principles behind gas analysis equipment
- purpose of valves, actuators and flanges
- layout of piping systems
- sumps and drains
- station pressure vessels/filtration equipment
- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant/pipeline and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will

EVIDENCE GUIDE	
	include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of the pipeline and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	As a general rule assessment will require access to an operating pipeline system over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

EVIDENCE GUIDE

Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: • <i>PMAOPS236B Operate vehicles in the field</i> • <i>PMAOPS221B Operate and monitor prime movers</i> • <i>PMAOPS304B Operate and monitor compressors</i> • <i>PMAOPS223B Operate and monitor valve systems.</i>
Guidance information for assessment	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**

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 if the candidate, accessibility of the item, and local industry and regional contexts.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all items of equipment and unit operations which form part of the pipeline system. For your plant this may include (select relevant items): • compressor systems and equipment, including monitoring systems, anti surge systems, safety systems and compressor control systems • prime movers, including turbine engines, reciprocating engines and electric motors, • instrument and control systems • valve systems.
Typical problems	Typical problems for your plant may include: • gas/product leaks • incorrect valve positions • electrical problems • compressor or pump failure

RANGE STATEMENT	
	• out of current inspection status • gauge failure or hose rupture, leaks • instruments out of calibration • instruments and equipment requiring cleaning.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS231B Control gas odourisation

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, an operator in a gas odourising facility monitors the daily inventory of the odourising agent in the storage vessel. The operator also: • checks and maintains the odourising rate of the injection pumps • facilitates bulk transfers to maintain working levels • initiates scheduled duty and standby cycles for the injection equipment.

Application of the Unit

Application of the unit	The operator is familiar with the physical and chemical properties of the product and understands all the safety issues set down in the materials safety data sheet (MSDSs), associated with this chemical. The operator would: • identify and rectify operational problems • respond to emergency situations Generally the operator would be part of a team during startup and shutdown procedures and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare to odourise gas.	2.1. Check operational equipment and take appropriate action 2.2. Apply odourant injection start up procedure 2.3. Maintain records.
3. Control odourisation in accordance with legislative requirements	3.1. Maintain the odour of the gas 3.2. Store odourant 3.3. Handle or transport odourant 3.4. Handle waste products in accordance with legislative requirements 3.5. Complete reports and logs 3.6. Monitor odourisation and take appropriate action.
4. Shut down odourisation operations	4.1. Apply shutdown procedure in accordance with operating conditions 4.2. Apply emergency procedures when required 4.3. Maintain records/reports.

ELEMENT	PERFORMANCE CRITERIA
5. Isolate and de-isolate plant.	5.1. Isolate plant 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the gas odourisation system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- process gas variations
- instrument failure/wrong readings
- electrical failures
- mechanical failures
- operational problems.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- identify all items on a schematic of the gas odourisation equipment and describe the function of each
- gas odourisation systems and their component functions
- nature/condition of materials entering and leaving each stage of the process
- changes which have occurred in each stage and why they have occurred
- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies

REQUIRED SKILLS AND KNOWLEDGE

- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the gas odourisation plant and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects for assessment and evidence required to demonstrate

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective

EVIDENCE GUIDE	
competency in this unit	action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	As a general rule assessment will require access to an operating gas odourisation system over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all items of equipment and unit operations which form part of the gas odourisation system. For your plant this may include: • emergency response kit including absorption material • neutralising agents • storage level indicator (magnetic detector) • personal protective equipment • molecular sieve for venting • pumps and flow control equipment.
Typical problems	Typical problems for your plant may include: • suction vapour locks • diaphragm ruptures • low suction pressure • flow regulator failures • gas leaks and fires • equipment failures.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes

RANGE STATEMENT	
	• batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS232B Produce product by filtration

Modification History

Release 2 – Addition of metalliferous minerals to unit descriptor and minor editorial corrections.

Unit Descriptor

This competency covers the skills needed to operate typical standalone dual phase (solid/fluid) separation equipment as used in a chemical, oil/ hydrocarbons, metalliferous minerals processing or other plant.

Application of the Unit

In a typical scenario, a product is filtered to remove a particulate solid (precipitate/cake) from the liquid (filtrate). The filtrate or the precipitate may be the product. The operations technician will monitor pressure differentials through filtration equipment and may check temperature gradients, product flows and levels in order to confirm the correct working status of all the equipment under control. Filter vessels and internals vary depending on process requirements.

The operations technician would:

- identify and correct operational problems
- determine the impact of differential pressure changes and adjust process variables accordingly
- liaise with maintenance to schedule equipment availability.

Generally the operations technician would be part of a team during startup and shutdown procedures and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does not cover powered separation equipment (e.g. centrifuge) or chemical separation equipment which are instead covered by:

- *PMAOPS247A Operate powered separation equipment*
- *PMAOPS208B Operate chemical separation equipment.*

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
2	Start up/shut down the filter system	2.1	Select the appropriate filtration units or the appropriate number of units to ensure product specifications are met
		2.2	Check the condition of all process equipment before start-up
		2.3	Make filtration equipment or systems ready and bring components and entire system on line
		2.4	Shut down individual components and whole system as required
3	Monitor the filtration process	3.1	Monitor process systems to ensure that product specifications are met
		3.2	Monitor and keep filtration equipment within requirements
		3.3	Liaise with appropriate people as required
		3.4	Take appropriate action
		3.5	Complete records as required

4	Isolate and de-isolate plant	4.1	Isolate plant
		4.2	Make safe for required work
		4.3	Check plant is ready to be returned to service
		4.4	Prepare plant for return to service.

Required Skills and Knowledge

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the filtration system and to distinguish between causes of problems/alarm/fault indications, such as:

- process variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- identify all items on a schematic of the filter system and describe the function of each
- principles of the filtration process
- filter cake properties where appropriate
- systems operating parameters
- principles of operation of separation equipment
- behaviour of solids, liquids and gases
- function and troubleshooting of major internal components and their problems, such as cartridges, baskets, supports, nozzles and grids
- typical problems with separation equipment and their remedy
- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit and the materials involved
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- duty of care obligations
- hierarchy of control

- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling filtration
- causes of head loss in filtration systems, including cakes and cake compressibility
- corrective action appropriate to the problem cause
- types and causes of problems within operator's scope of skill level and responsibility

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.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3-D virtual reality interactive systems.

This unit of competency requires an application of the knowledge contained in the use of filtration and integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In

particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Context of and specific resources for assessment

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Method of assessment

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- *PMAOPS201B Operate fluid flow equipment*
- *MSAPMSUP210A Process and record information.*

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- *MSAPMOHS200A Work safely.*

Guidance information for assessment

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

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.

**Codes of practice/
standards**

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit of competency includes all such items of equipment and unit operations which form part of the filtration system. For your plant this may include (select relevant items):

- plate and frame filters
- leaf filters
- cartridge filters
- bed (sand/gravel) filters
- disk/edge filters
- membranes
- other filters
- differential pressure monitoring equipment

Typical problems

Typical problems for your plant may include:

- control pressure
- effects on upstream and downstream plant
- clogging
- seal/gasket leaks
- pressure loss/low flow
- cartridge/filter change
- blockages/build-up/fouling
- erosion/wear

Appropriate action

Appropriate action includes:

- determining problems needing action
- determining possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility to designated person

Procedures

Procedures may be written, verbal, computer-based or in some

other form. They include:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations.

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Operational/technical

Competency field

Not applicable

Co-requisite units

Not applicable

PMAOPS233A Monitor wells and gathering systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency is an entry level competency for a field operator. It covers the basic skills required to monitor wells and associated equipment in the field and to recognise and report problems, but not necessarily to rectify problems or make adjustments.

Application of the Unit

Application of the unit	This unit of competency applies to field operators who are responsible for a number of wells and their associated systems. In a typical scenario, the operator will be driving alone, on and off roads between wells and also to and from the base site or plant. While at a site, they will be monitoring well and equipment performance by taking readings, making checks, recording and reporting their findings in accordance with procedures. They will also be expected to identify hazards and take appropriate action. This competency is typically performed by operators working independently while in communication with a field or plant operator with whom they would work as part of a team. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel 1.4. Determine appropriate route/schedule for day's work
2. Complete site checks	2.1. Check equipment condition and operation 2.2. Check required levels 2.3. Top up levels as required 2.4. Complete logs and reports as required
3. Use well control systems as required	3.1. Check well control systems validity 3.2. Perform other required well control system tasks 3.3. Complete logs and reports as required
4. Take required	4.1. Complete all required readings for site

ELEMENT	PERFORMANCE CRITERIA
readings	4.2.Compare all read values with the desired range 4.3.Compare read values with previous log sheet values 4.4.Complete logs and reports as required
5. Complete required lease maintenance	5.1.Inspect lease area for items requiring action 5.2.Complete required lease maintenance actions 5.3.Complete logs and reports as required
6. Finalise shift activities	6.1.Complete shift tasks as appropriate 6.2.Ensure identified faults are correctly logged/reported for action 6.3.Ensure incomplete tasks are scheduled for follow up 6.4.Ensure all logs and reports are complete and understood

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- coal seam gas (CSG) formation, structure and completions
- coal type and structure
- well design and construction
- hydrate formation
- free flow and pumped wells
- pumping principles
- gas flow principles

REQUIRED SKILLS AND KNOWLEDGE

- gas/water separation principles
- draining and venting requirements
- typical issues causing problems
- lease requirements
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- static electricity and earthing
- chemical handling and material safety data sheets (MSDS)
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their symptoms
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation of each
- physics and chemistry relevant to each unit and the processes used
- flange pressure and temperature ratings (basic)
- cathodic protection (basic)
- relevant environmental and heritage requirements
- protective systems
- control systems
- remote terminal unit, functions, operation and problems

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

This unit of competency requires an application of the knowledge contained in the use of the equipment, to the level needed to maintain control and recognise and resolve problems.

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

Assessment for this unit of competency will be on a plant.

It is essential that the equipment be understood and that the importance of critical material properties, settings

EVIDENCE GUIDE	
	and readings is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • appropriate inspections are made • required readings are taken • early warning signs of equipment processes needing attention or with potential problems are recognised • necessary actions are completed. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.
Context of and specific resources for assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training. A bank of scenarios/case studies/what-ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.

EVIDENCE GUIDE**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**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

Procedures may be written, verbal, computer-based or in some other form. They include:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations

All work will comply with procedures

Site

Site may be:

- a well
- a nominated area in the gathering system
- another location where the operator is required to work

RANGE STATEMENT	
Equipment	Typical items of plant and equipment included in this unit of competency are: • wellheads • choke and control valves • meters • flow lines • high point vents • low point drains • valves including non-return and pressure/vacuum relief • pumps and their prime movers • product separation units • instrumentation and control systems (variable speed drive (VSD) and proportional integral derivative (PID)) • testing equipment • power units • drive heads • flares
Equipment condition and operation	Equipment condition and operation may include: • chemical injection equipment • storage tanks • pumps and pump speed • autodumps • drains and drain points • vents and high points • leaks • other items
Levels	Levels may include: • chemical storage levels • lubricating oil levels • water and gas levels • battery levels • drain levels • other levels
Logs and reports	Logs and reports may be paper or electronic based and may also include verbal/radio reports

RANGE STATEMENT	
	Reports include reporting items found which require action
Lease maintenance areas requiring action	Lease maintenance areas requiring action may include: • land erosion • fence and gate integrity • weeds and other growth • actions of feral or other fauna • other required items
Identified faults	Identified faults may include: • instrumentation failure/malfunction • electrical failure/malfunction • mechanical failure/malfunction • control system failure/malfunction • mismatch between flow rates and system requirements • wear, tear and corrosion of plant and equipment
Typical problems	Typical problems may include: • leakage • solids (formation fines) • vibration • loss of control of pressure and/or flow • hydrate formation and blockages • liquid slugging • corrosion • erosion • sulphate reducing bacteria • scale formation • equipment failure
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state, territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS234A Monitor and operate low pressure compressors

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of low pressure compressors which are typically relatively simple to operate. The compressor may, or may not, have a high level of technical complexity. The compressor may have essential ancillary equipment but the operation of this ancillary equipment is largely integrated with the normal operation of the compressor unit itself. It includes the recognition and resolution of routine only problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for the operation of compressors which are relatively simple to operate. Typically the compressor may be used to provide suction or a moderately low pressure only. The compressor may be technically sophisticated and/or have sophisticated controls built in, but its operation is relatively simple. A typical example might be the operation of a low pressure, low volume screw compressor in a coal seam gas (CSG) gathering system. This Training Package has three possible units of competency applicable to the operation of compressors: • <i>MSAPMOPS100A Use equipment</i> which is applicable to the typical, small, hired, skid or trailer mounted compressor where the major operation is to turn on and turn off and maybe monitor pressure and perhaps another variable or two (e.g. water removal) • <i>PMAOPS234A Monitor and operate low pressure compressors</i> (this unit) applies to low pressure, usually simple to operate compressors, but still ones requiring start-up/shutdown and some monitoring and

	adjustment • <i>PMAOPS304B Operate and monitor compressor systems and equipment</i> which is applicable to complex compressors, typically delivering high pressure and also requiring the operation of prime movers, intercoolers and forced lubrication systems. These compressors are usually high pressure, high volume compressors. The operator will also be expected to: • identify hazards and take appropriate action • recognise problems • resolve routine problems • report other problems. This competency is typically performed by operators working independently while in communication with a field or plant operator with whom they would work as part of a team. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Operate compressor	2.1. Identify type of compressor 2.2. Start up and shut down compressor according to compressor type and duty 2.3. Complete routine checks, reads and logs 2.4. Make adjustments as required 2.5. Identify problems and take appropriate action 2.6. Complete logs and reports as required
3. Isolate and de-isolate compressor	3.1. Isolate compressor 3.2. Make safe as required 3.3. Check plant is ready to be returned to service 3.4. Prepare plant for return to service 3.5. Complete logs and reports as required

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation

REQUIRED SKILLS AND KNOWLEDGE

- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- compressor/pumping principles
- gas flow principles
- typical issues causing problems
- process parameters and limits (e.g. temperature, pressure and flow)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their symptoms
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation of each
- physics relevant to the processes used
- flange pressure and temperature ratings (basic)
- relevant environmental and heritage requirements
- protective systems
- control systems

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

This unit of competency requires an application of the knowledge contained in the use of the equipment, to the level needed to maintain control and recognise and resolve problems.

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

Assessment for this unit of competency will be on a plant.

It is essential that the equipment be understood and that the importance of critical material properties, settings and readings is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

Consistent performance should be demonstrated. In particular look to see that:

- appropriate checks are made
- required readings are taken
- early warning signs of equipment processes needing attention or with potential problems are recognised
- necessary actions are completed.

Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.

Context of and specific resources for assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training.

A bank of scenarios/case studies/what-ifs and questions will be required to probe the reasoning behind observable actions.

EVIDENCE GUIDE	
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.
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

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	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations All work will comply with procedures

RANGE STATEMENT	
Routine check reads and logs	Routine check reads and logs may include: • lubricating oil levels • temperatures (inlet and outlet) • pressures (inlet and outlet) • speed • other items
Logs and reports	Logs and reports may be paper or electronic based and may also include verbal/radio reports Reports include reporting items found which require action
Identified faults	Identified faults may include: • instrumentation failure/malfunction • electrical failure/malfunction • mechanical failure/malfunction • control system failure/malfunction • mismatch between flow rates and system requirements • wear, tear and corrosion of plant and equipment
Typical problems	Typical problems may include: • leakage • vibration • loss of control of pressure and/or flow • blockages • equipment failure • lack of water removal from gas • high differential pressure on lube oil filters
Start up/shut down as required	Start up/shut down as required includes: • start up and shut down to/from normal operating conditions • replacement of faulty units • start up and shut down to/from isolated, cold, empty • all other conditions experienced on the plant, i.e. from any condition to any condition experienced on the plant

RANGE STATEMENT	
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person In this unit problem solving is restricted to routine problems only
Routine problems	Respond to routine problems means 'apply known solutions to a limited range of predictable problems'. Typically such problems and their solutions are listed in the procedures
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state, territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS240B Store fluids in bulk

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the storage and transfer of fluids to and from tanks. In a typical scenario the plant technician will manage a series of liquid storage tanks for raw materials and finished product as part of the production process. The plant technician will arrange for the unloading of tanker trucks, transfer of liquids from the storage tanks to processing area, finished product to the appropriate tanks and also loading of tankers with finished product.

Application of the Unit

Application of the unit	The plant technician will be able to: • identify the material and interpret any special handling or storage requirements, including dangerous or hazardous goods requirements, from the available information • ensure that the destination for the liquid is appropriately prepared, has enough capacity and is correctly piped • check that the liquids are being stored safely in tanks and that safety equipment and services are monitored • respond to emergency situations. This unit does not apply to the transfer and storage of bulk materials typically found within refinery storage areas or hydrocarbons processing areas. For these areas refer to <i>PMAOPS307B Transfer of product into land or sea based storage facility</i>. Generally the plant technician would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare storage/ loading facilities.	2.1. Ensure that products are being stored in the tank area to procedures 2.2. Inspect storage facilities for leaks or damage 2.3. Check and test safety equipment and systems to verify their operational condition and status, and report all equipment faults 2.4. Confirm quantities and specifications of stored liquids in the tank area 2.5. Identify all equipment requiring maintenance 2.6. Take appropriate action
3. Transfer fluids	3.1. Confirm tank capacities and identification and quality of current

ELEMENT	PERFORMANCE CRITERIA
to and from tanks	contents, and determine if these are being maintained within the agreed product requirements prior to transfer 3.2.Ensure all areas involved in the transfer are safe to allow transfer of liquids to occur 3.3.Inspect all transfer equipment before transfer, including lines, hoses, pumps, fittings, instruments and controls 3.4.Confirm that transfer destination has sufficient capacity for the transfer 3.5.Take appropriate action 3.6.Transfer liquids safely to procedures 3.7.Conduct cleaning, purging or draining as required 3.8.Record transfer as required.
4. Isolate and de-isolate plant.	4.1.Isolate plant 4.2.Make safe for required work 4.3.Check plant is ready to be returned to service 4.4.Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Required knowledge

Demonstration of competence in this unit must include knowledge of the following:

- all items on a schematic of the tank farm and the function/s of each
- testing techniques
- equipment isolation and purging
- use and operation of safety equipment, including breathing apparatus if required
- tank and product mixes
- flow rates and measures

REQUIRED SKILLS AND KNOWLEDGE

- tank capacities and percentages
- static electricity principles.
- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling plant
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems.

Sound knowledge of storage and transfer techniques required for transport of oil, gas or water is expected.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment or storage facility in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

EVIDENCE GUIDE	
	This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

EVIDENCE GUIDE	
	<i>PMAOPS201B Operate fluid flow equipment.</i> In a major hazard facility, it may be appropriate to assess this unit concurrently with: <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations, which form part of the storage and loading system. For your facility this may include (select relevant items): - tanks - vessels - pumps - compressors - road or rail tanker loading facilities - gauges - fire protection and deluge systems - inert gas blanketing or purging systems (eg nitrogen) - gas detection systems and equipment - tank dipping and measurement equipment.
Products	Products may include any fluid material or product in the plant and stored in bulk.

RANGE STATEMENT	
Fluid	Any material which flows, and includes materials which: • are normally a liquid at ambient conditions • are normally a gas at ambient conditions • have been liquefied • have been vapourised • have been melted • are in a condition when they can flow.
Problems	Typical problems for your facility may include: • interruptions to loading through adverse weather conditions • selection of appropriate storage facility • control of temperature and pressure • variations in feed • vibration • tank capacities and space.
Start up shut down as required	Start up shut down as required includes: • start up and shut down to/from normal operating conditions • start up and shut down to/from isolated, cold, empty all other conditions experienced on the plant, ie from any condition to any condition experienced on the plant.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg

RANGE STATEMENT	
	Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS241A Operate Joule-Thomson effect device

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of a range of equipment generally covered by the title 'Joule-Thomson device'. These are typically encountered in any cryogenic process and are a critical part of the 'cold end' or refrigeration cycle.

Application of the Unit

Application of the unit	In a typical scenario, an operator monitors and operates a cryogenic plant which liquefies hydrocarbons, air or other gas. The purpose of the liquefaction may be to then separate the components by distillation or other means, or there may be other reasons for liquefying the gas (e.g. to reduce volume for shipping). The gas being liquefied may also be the refrigerant fluid used for at least part of the cooling/liquefaction cycle. This may be undertaken in conjunction with other refrigeration and/or cooling processes. The operator will typically operate the entire cooling and liquefaction operation and so will also be operating a compressor (<i>PMAOPS304B Operate and monitor compressor systems and equipment</i>), a heat exchanger (<i>PMAOPS205B Operate heat exchangers</i>), and a dryer (<i>PMAOPS206B Operate separation equipment</i>, <i>PMAOPS326B Produce product using gas absorption</i>, <i>PMAOPS327B Produce product using fixed bed dehydration</i>, or <i>PMAOPS329B Produce product using liquid extraction</i> depending on the process). The operator would:

	• identify and take appropriate action on operational problems • contribute to the safe and productive operation of the equipment • monitor, operate and be responsible for the plant. Generally the operator would be part of a team during startup and shutdown procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel, but operating a local or central panel may be part of the job for some (these are covered by separate units). This competency covers all Joule-Thomson type devices, such as turbo expanders, expansion turbines and expansion engines.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Monitor and operate Joule-Thomson device	2.1. Monitor product produced 2.2. Monitor and record critical process variables to procedures 2.3. Monitor performance of support units 2.4. Monitor performance of ancillary skids 2.5. Identify issues requiring action 2.6. Take appropriate action to procedures
3. Bring plant on and off line	3.1. Shut down plant as required 3.2. Isolate plant 3.3. Make plant safe as required 3.4. Check plant is ready to be returned to service 3.5. Prepare plant for return to service 3.6. Start up plant as required 3.7. Changeover online device if required

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:

- recognising conditions which will lead to out of specification product or unsafe situation
- implementing the enterprise's procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents, instrumentation and technical information

Required knowledge

Required knowledge includes:

- hazards associated with the process
- cryogenic hazards associated with the process and the materials
- cryogenic materials, their lines and vessels
- metal embrittlement
- application of the hierarchy of control in controlling the hazards
- Joule-Thomson principles
- adiabatic/constant enthalpy expansion, inversion temperature
- principles of operation of particular devices installed on plant
- importance of the temperature range (and other critical variables)
- gas properties (Boyles and Charles laws)
- product dew point (i.e. dew point of the hydrocarbon, air or other gas being condensed)
- importance of (lack of) moisture (and other contaminants) in the process stream
- consequences of deviations from the desired values of critical variables
- safe start-up from different conditions (e.g. warm vs cold starts)

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

It is essential that the equipment be understood and that the importance of critical properties, settings and

EVIDENCE GUIDE	
competency in this unit	readings is known. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • hazards are identified and controlled • product properties are kept within limits • quality is monitored to minimise wastage • process measurements/observations are continually made • all HSE requirements are followed • problems are anticipated and appropriate action is taken (i.e. problem fixed or reported).
Context of and specific resources for assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training. A bank of scenarios/case studies/what-ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication

EVIDENCE GUIDE	
	units. Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.
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

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 standard procedures. Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations
Joule-Thomson device	A Joule-Thomson device is any device which requires a gas/vapour to do work, typically by expanding, so cooling the vapour (i.e. uses the Joule-Thomson effect). While the vapour will not usually condense in the Joule-Thomson device it will often condense immediately on leaving the

RANGE STATEMENT	
	device. Some devices may be constructed to allow for condensation to occur within the device, this is sometimes also called the Joule-Kelvin effect
Hazards	Hazards include: • process hazards • cryogenic materials • cryogenic hazards • cold embrittlement • other hazards
Product produced	Product produced will typically be monitored for: • value of critical variables • state (liquid/vapour) • production rate (e.g. volume or mass flow rate) • other properties
Critical variables	Critical variables will typically include: • temperature • pressure • pressure drops • purity/contaminants and may include: • inlet guide vane (IGV) blade angles • speed of rotation • other variables
Support units	Support units include: • lubricating oil • dry gas seals • other seals • other units
Ancillary equipment	This unit also covers ancillary equipment which forms part of the Joule-Thomson system
Appropriate action	Appropriate action includes: • recognising actual and potential problems • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility

RANGE STATEMENT	
	• following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person
Start up/shut down as required	Start up/shut down as required includes: • start up and shut down to/from normal operating conditions • start up and shut down to/from isolated, cold and empty • all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state, territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

Co-requisite units		

PMAOPS242A Moor ships for transfer of bulk processed particulates or fluids

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to moor ships to a company or public facility for loading/unloading of bulk product. It includes the preparation and berthing of vessels and releasing vessels carrying bulk processed particulates or fluids.

Application of the Unit

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit applies:

- where process operators have responsibility for the mooring of a ship to a company or public facility
- the ship will typically be carrying bulk processed particulates or fluids.

It could be applied to a land-based mooring, a floating storage and offtake/floating production storage and offtake vessel (FSO/FPSO), buoy or similar mooring.

It may be appropriate to consider this unit with *PMAOPS312B Undertake ship loading/unloading operations*. Where relevant this unit should also be accessed.

This unit has been written to apply to the berthing of vessels transporting liquefied natural gas (LNG), liquefied petroleum gas (LPG), other bulk fluids and bulk processed particulates.

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	Prepare for work	1.1	Identify work and compliance requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check operational status of required plant/equipment
		1.5	Complete any required pre-berthing checks
2	Deploy hazard and environmental controls, as required	2.1	Check required controls are available and functional
		2.2	Deploy controls in accordance with procedures
		2.3	Withdraw controls in accordance with procedures
3	Berth ship	3.1	Communicate as required with relevant personnel
		3.2	Receive and carry out instructions from shipping officer
		3.3	Secure vessel in accordance with procedure
		3.4	Ensure ship is positioned ready to receive or discharge
		3.4	Ensure all hazard controls are followed

4	Release ship	4.1	Communicate as required with relevant personnel
		4.2	Receive and carry out instructions from shipping officer
		4.3	Release vessel in accordance with procedure
		4.4	Ensure all hazard controls are followed
5	Recognise problems and take appropriate action	5.1	Monitor mooring operation throughout the process
		5.2	Adjust process as required by procedures
		5.3	Take other appropriate actions on problems

Required Skills and Knowledge

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

Required skills

Required skills include:

- recognising conditions which will lead to out of range conditions
- implementing enterprise procedures within time constraints and in a manner relevant to the correct mooring procedure
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of consistency of operation
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge, to the breadth and depth required for the operation of the well and gathering systems includes:

- principles of mooring
- desirable parameters and limits (e.g. location relative to loading/unloading equipment, and speed of approach)
- duty of care obligations
- potential equipment and site hazards
- procedures and relative documentation

- isolation devices type and purpose
- emergency, fire suppression, fire alert and disaster procedures
- environmental incident management procedures
- hazard identification and risk assessment response procedures
- equipment associated with mooring operations
- relevant work health and safety (WHS) legislation and policies
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms, and the corrective action to be taken
- relevant environmental and heritage requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria required skills and knowledge range statement and the Assessment Guidelines for the Training Package.

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

Critical aspects for assessment and evidence are:

- ship is berthed and released smoothly
- berthed ship is in position to receive or discharge product
- health, safety and environment (HSE) controls are used as required.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Mooring operations

Mooring operations include, but are not limited to:

- throwing/heaving ship's lines
- capstan winch operation
- setting quick release hooks
- running out mooring line
- securing ship's lines
- releasing ship's lines
- preparing mooring area for operation
- making fast to wharf, dolphin or mooring buoy
- securing mooring lines

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- determining possible fault causes

- rectifying predictable problems using appropriate solution from procedures
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/scope of procedures to designated person

Typical problems

Typical problems may include, but are not limited to:

- poor weather
- language issues with crew
- problems with ship's equipment

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector(s) Operational/technical

Competency field**Custom Content Section**

Not applicable.

PMAOPS246A Operate separation equipment

Modification History

New unit – Replaces PMAOPS206B - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate typical stand-alone dual phase separation equipment as used in a chemical, oil/hydrocarbons or metalliferous minerals processing plant, and solving problems with separation processes.

Application of the Unit

This unit applies to a person who has the responsibility for starting up and shutting down separation operations in accordance with procedures, and making adjustments to flow rate and pressure, depending on the type of separation equipment.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit does not cover powered separation equipment (e.g. centrifuge), or chemical separation equipment, which are instead covered by:

- PMAOPS247A Operate powered separation equipment
- PMAOPS208B Operate chemical separation equipment.
-

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of separation plant/equipment
		1.7	Complete any required pre-start checks
2	Operate separation equipment	2.1	Identify the type of separation equipment
		2.2	Start up and shut down separation equipment according to the separation equipment type and duty
		2.3	Adjust flow and pressure as appropriate to type of separation equipment
		2.4	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends.
3	Recognise problems and take appropriate action	3.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		3.2	Recognise developing situations which may require action

		3.3	Make appropriate adjustments to separation equipment and duty
		3.4	Take other appropriate actions on separation problems, as required
		3.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
4	Isolate and de-isolate plant.	4.1	Isolate plant
		4.2	Make safe for required work
		4.3	Check plant is ready to be returned to service
		4.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- efficient and effective operation of plant/equipment
- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- application of mathematics to the level required by the job

Required knowledge

Required knowledge of separation equipment principles and typical problems to a level needed to control the operation, includes:

- principles of operation of separation plant/equipment
- process parameters and limits (e.g. temperature, pressure, flow and pH)

- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- physics and chemistry relevant to each unit and the processes used
- relevant environmental and heritage requirements
- mathematical formulae and their application to the job

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety

requirements of the site and consistent with workplace systems or procedures.

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.

Context

This competency includes all types of stand-alone separation equipment for gaseous, liquid and solids separation where the separation process is physical and the separator is not powered or motor driven. Separation equipment covered by this competency includes, but is not limited to:

- cyclones
- hydrocyclones
- scrubbers
- knockout drums
- demisters/drift eliminators
- filters (cartridge, basket, sand, and so on)
- spiral separators

Procedures

Procedures may be written, verbal, computer-based or in some other form. They may include but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- seal/gasket leaks
- pressure loss/low flow
- cartridge/filter change
- blockages/build-up/fouling
- erosion/wear

Start up and shut down as required

Start up and shut down as required includes:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold, empty
- all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector(s) Operational/technical

Competency field

Custom Content Section

Not applicable.

PMAOPS247A Operate powered separation equipment

Modification History

New unit – Replaces PMAOPS207B – Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate typical powered dual phase separation equipment as used in a chemical, oil/hydrocarbons or metalliferous minerals processing plant. It also includes solving problems with separation processes and the equipment, including the driver powering the separation equipment.

Application of the Unit

This unit applies to a person who has the responsibility for starting up and shutting down separation equipment to procedures, and making adjustments to flow rate and pressure, depending on the type of separation equipment.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator as appropriate.

This unit does not cover stand alone, non-powered dual phase separation equipment or chemical separation equipment, which are instead covered by:

- *PMAOPS246A Operate separation equipment*
- *PMAOPS208B Operate chemical separation equipment.*

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of separation plant/equipment
		1.7	Complete any required pre-start checks
2	Operate powered separation equipment	2.1	Identify the type of powered separation equipment
		2.2	Start up and shut down separation equipment according to the separation equipment type and duty
		2.3	Adjust flow and pressure as appropriate to type of separation equipment
		2.4	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends
3	Operate drivers of separation equipment	3.1	Monitor critical variables, such as amps, temperature and vibration
		3.2	Keep critical variables in range
		3.3	Recognise trends/patterns which indicate a potential or actual problem with the driver

		3.4	Take appropriate action to ensure driver is returned to full performance in a timely manner
4	Recognise and take appropriate action on problems	4.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		4.2	Recognise developing situations which may require action
		4.3	Make appropriate adjustments to separation equipment and duty
		4.4	Take other appropriate actions on separation problems, as required
		4.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
5	Isolate and de-isolate plant	5.1	Isolate plant
		5.2	Make safe for required work
		5.3	Check plant is ready to be returned to service
		5.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- efficient and effective operation of plant/equipment
- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively

- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- applying mathematics to the level required by the job

Required knowledge

Required knowledge of separation equipment principles and typical problems to a level needed to control the operation, includes:

- principles of operation of separation plant/equipment
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- physics and chemistry relevant to each unit and the processes used, including kinetic energy effects
- causes of head loss in piping systems, including comparison of fittings using Le/d concept, fluid and pipe material properties, flow geometry, and so on
- function and troubleshooting of major internal components and their problems, such as internals, supports, nozzles, grids, agitators or scrapers
- relevant environmental and heritage requirements
- mathematical formulae and their application to the job

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined

- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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.

Context

This competency includes all types of powered separation equipment for gaseous, liquid and solids separation duties, including, but not limited to:

- centrifuges
- rotary dryers
- rotary vacuum filters
- flotation cells/columns
- thickeners/clarifiers

Procedures

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- seal/gasket leaks
- pressure loss/low flow
- cartridge/filter change
- blockages/build-up/fouling
- erosion/wear
- separator driver problems

Remedial actions

Remedial actions may include, but are not limited to:

- making adjustments to the equipment (e.g. flow and pressure)
- carrying out minor maintenance within operator's skill level
- identifying and reporting problems outside

	operator's scope of ability
	identifying and controlling hazards related to powered separation equipment and surrounding areas
Start up and shut down as required	Start up and shut down as required includes: - start up and shut down to/from normal operating conditions - start up and shut down to/from isolated, cold or empty - all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector(s) Operational/technical

Competency field

Custom Content Section

Not applicable.

PMAOPS260A Conduct screening operations

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to conduct screening operations in metalliferous processing, extractive and other industries using screens to separate coarser from finer solids. It includes the planning and preparing for operations, conducting screening plant operations and carrying out post-operational procedures.

Application of the Unit

This unit applies to a person who has the responsibility for starting, stopping and monitoring screening operations and covers a variety of screen types.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit has a relationship with other materials handling competencies, such as *PMC552008B Operate crushing equipment*, *PMC562070B Move materials and PMAOPS210B Operate particulates handling equipment*, which may apply as part of the processing operation.

This unit requires a detailed knowledge of screening operations, screen types and operating principles.

This unit has been written to apply to screening/sizing operations as they occur with crushed/ground solid material. However, it should also be applicable to applications wherever particulates of different sizes need to be separated/classified, such as plastic pellets, and where solids feed to a process, with appropriate contextualisation.

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	Plan and prepare for operations	1.1	Identify work requirements
		1.2	Coordinate with appropriate personnel
		1.3	Check screen feed and discharge areas for obstructions and hazards
		1.4	Check operational status of equipment
		1.5	Complete any required pre-start checks
2	Operate screening plant	2.1	Ensure start-up sequence for screen and ancillary equipment follows workplace requirements
		2.2	Start up and shut down screening equipment according to standard operating procedures
		2.3	Monitor feed and discharge rates to ensure efficient and safe screen operation
		2.4	Complete routine checks, taking appropriate action on unexpected operating conditions

3	Rectify routine problems	3.1	Identify the range of faults that can occur during the operation
		3.2	Determine and rectify fault causes by procedures/work instructions
		3.3	Identify and rectify equipment failure causes in accordance with procedures/work instructions
		3.4	Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions
		3.5	Identify non-routine problems and report to designated person
4	Control hazards	4.1	Identify hazards in the screening area
		4.2	Assess the risks arising from those hazards
		4.3	Implement measures to control those risks in line with procedures and duty of care
		4.4	Carry out basic maintenance and inspection practices

Required Skills and Knowledge

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- principles of operation of screening equipment
- process parameters and limits
- types of screen cloths
- effects of bed density
- causes of contamination
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- physical principles, including:
 - sinusoidal vibration or gyratory vibration
 - gravity
 - density of materials
 - electrostatic force
 - stratification
- screening terminology, including:
 - amplitude
 - acceleration
 - blinding
 - brushing
 - contamination
 - deck
 - frequency

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely

return to full performance

- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process. It may be appropriate to consider assessment concurrently with the following units:

- *PMC552008B Operate crushing equipment*
- *PMC562070B Move materials*
- *PMAOPS210B Operate particulates handling equipment.*

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- determining possible fault causes
- rectifying predictable problems using appropriate solution from procedures
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/scope of procedures to designated person

Typical problems

Typical problems may include, but are not limited to:

- feed or discharge blockages
- blinding
- screen cloth blockages
- electro-static build-up
- aggregate size contamination

Screening equipment types

Screening applications include:

- wet screening
- dry screening

Screening equipment covered by this unit includes:

- moving screen
- static screen
- rotary screens

	• circle-throw vibrating equipment • high frequency vibrating equipment • gyratory equipment
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Work requirements	Work requirements may come from briefings, handovers, and work orders and may include: • compliance documentation • product specifications • nature and scope of tasks • achievement targets • operational conditions • geological data • site survey data • site layout and out of bounds areas • worksite inspection requirements • lighting conditions • plant or equipment defects • hazards and potential hazards • coordination requirements or issues
Appropriate personnel	Appropriate personnel may include: • other process operators • contractors • laboratory personnel • mobile plant operators • maintenance personnel
Unit Sector(s)	
Unit Sector(s)	Operational/technical
Competency field	

Custom Content Section

Not applicable.

PMAOPS261A Operate bulk solids loading equipment

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate a range of equipment used to convey and load bulk solids.

Application of the Unit

This unit applies to a person who has the responsibility for the operation of filling and loading equipment for bulk solids in sealed containments for shipment from the plant by road or rail. It can include a range of supplementary equipment. It is not intended to apply to line conveyors as part of a ship loading system.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit applies in metalliferous processing plants and other plants which load bulk solids.

This unit has been written with minerals processing plants as the specific focus. However, it could also be applied to any plant in which raw product is produced for transporting for further processing, such as in the manufacture of plastics or other particulates with appropriate contextualisation.

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	Prepare for work	1.1	Check documentation for load-out details
		1.2	Identify work requirements
		1.3	Identify and report any hazards in accordance with procedures
		1.4	Coordinate with appropriate personnel
		1.5	Check operational status of equipment
		1.6	Complete any required pre-start checks
2	Manage bulk material storage and operate load-out equipment	2.1	Visually inspect storage facility and load-out equipment
		2.2	Determine levels of solids in storage using appropriate indicators
		2.3	Ensure load-out equipment is ready for operation
		2.4	Ensure storage discharge areas are free from obstructions
		2.5	Operate load-out equipment
		2.6	Monitor flow of materials as appropriate
		2.7	Ensure containment is properly sealed according to procedures after load-out
		2.8	Move containment to transshipment area

3	Recognise problems and take appropriate action	3.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		3.2	Recognise developing situations which may require action
		3.3	Identify and rectify/report faults in accordance with established enterprise procedures
		3.4	Identify non-routine problems and report according to procedures
		3.5	Complete appropriate records and log books of equipment operations to meet enterprise requirements
4	Carry out maintenance procedures	4.1	Recognise a maintenance need according to procedure
		4.2	Isolate loading equipment and prepare for maintenance
		4.3	Complete minor maintenance according to procedures
		4.4	Receive plant back from maintenance and check for safe operation
		4.5	Prepare plant for the introduction of materials and for operation
5	Control hazards	5.1	Identify hazards in the load-out work area
		5.2	Assess the risks arising from those hazards
		5.3	Implement measures to control those risks in line with procedures
		5.4	Shut down load-out equipment in an emergency, as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- operating skills sufficient to correctly operate the equipment
- conveying information relevant to the operation clearly and effectively
- reading and numeracy to interpret workplace documents and technical information
- applying mathematics to the level necessary to monitor instrumentation

Required knowledge

Required knowledge, to the breadth and depth required for the operation of bulk particulates loading equipment, includes:

- principles of operation of load-out equipment
- process parameters and limits
- duty of care obligations
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- relevant environmental and heritage requirements
- distinguish between causes of problems, such as:
 - material
 - instrument
 - equipment (electrical/mechanical)
 - maintenance
- relevant work health and safety (WHS) and environmental requirements, along with an ability to implement them within appropriate time constraints and in a manner which is relevant to the operation of the materials load-out 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.

Critical aspects for assessment and evidence required to

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes

demonstrate competency in this unit

needing attention or with potential problems are recognised

- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes but is not limited to:

- determining problems needing action
- determining possible fault causes
- rectifying predictable problems using appropriate solution from procedures
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/scope to designated person

Equipment

Load-out equipment may include, but is not limited to:

- hoppers, bins or silos
- conveyors
- chutes
- dust extraction equipment and bag houses
- automated bagging or filling equipment
- vibratory settling equipment
- roller conveyors
- motorised lifting equipment
- appropriate personal protective equipment (PPE)
- weighing equipment
- moisture testing equipment

Containments

Solids containments may include, but are not limited to:

- bulk bags
- drums
- road tankers
- hopper cars
- containers
- sealed bins

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and

HSE requirements, the HSE requirements take precedence.

Typical problems

Typical problems may include:

- rat holing and bridging in silos/bins/hoppers
- routing issues
- equipment problems

Work requirements

Work requirements may come from briefings, handovers and work orders and may include:

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions
- site layout and out of bounds areas
- worksite inspection requirements
- lighting conditions
- plant or equipment defects
- hazards and potential hazards
- coordination requirements or issues

Appropriate personnel

Appropriate personnel may include:

- other process operators
- contractors
- laboratory personnel
- mobile plant operators
- maintenance personnel

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS262A Operate digestion equipment

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate typical digestion equipment as used in a metalliferous minerals processing plant. It also includes solving problems with digestion processes and equipment.

Application of the Unit

This unit applies to a person who has the responsibility for starting up and shutting down digestion equipment to procedures; and making adjustments to flow rate, pressure and temperature, depending on the type of digestion equipment.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit does not cover leaching equipment, which is instead covered by:

- *PMAOPS263A Operate leaching equipment.*

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of digestion plant/equipment
		1.7	Complete any required pre-start checks
2	Operate digestion equipment	2.1	Identify the type of digestion equipment
		2.2	Start up and shut down digestion equipment according to the digestion equipment type and duty
		2.3	Adjust flow, temperature and pressure as appropriate to type of digestion equipment
		2.4	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends
3	Recognise problems and take appropriate action	3.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		3.2	Recognise developing situations which may require action
		3.3	Make appropriate adjustments to digestion equipment and duty

		3.4	Take other appropriate actions on digestion problems, as required
		3.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
4	Isolate and de-isolate plant	4.1	Isolate plant
		4.2	Make safe for required work
		4.3	Check plant is ready to be returned to service
		4.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- efficient and effective operation of plant/equipment
- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge of digestion equipment principles and typical problems, to a level needed to control the operation, includes:

- principles of operation of digestion plant/equipment
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and

- permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- physics and chemistry relevant to each unit and the processes used
- function and troubleshooting of major internal components and their problems, such as internals, supports, pumps or agitators
- relevant environmental and heritage requirements
- pressure relief systems (e.g. valves and rupture discs)
- containment systems
- interlocks

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for

Assessment processes and techniques must be

assessment

appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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.

Context

This competency includes all types of digestion equipment, including but not limited to:

- autoclave digesters
- tube digesters

Procedures

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and

plant data

- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- seal/gasket leaks
- pressure loss/low flow
- high pressure
- blockages/build-up/fouling
- erosion/wear
- driver problems
- temperature excursions (high or low)

Remedial actions

Remedial actions may include, but are not limited to:

- making adjustments to the equipment (flow, pressure, etc)
- carrying out minor maintenance within operator's skill level
- identifying and reporting problems outside operator's scope of ability
- identifying and controlling hazards related to digestion equipment and surrounding areas

Start up and shut down as required

Start up and shut down as required includes:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold or empty
- all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Work requirements

Work requirements may come from briefings, handovers and work orders and may include:

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions
- lighting conditions
- plant or equipment defects
- hazards and potential hazards
- coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS263A Operate leaching equipment

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate typical leaching equipment as used in a metalliferous minerals processing plant. It also includes solving problems with leaching processes and the equipment, including ancillary equipment.

Application of the Unit

This unit applies to a person who has the responsibility for starting up, shutting down and operating leaching equipment to procedures, and making adjustments (e.g. feed rate) to the leaching equipment.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit does not cover digestion equipment, which is instead covered by:

- *PMAOPS262A Operate digestion equipment.*

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of leaching plant/equipment
		1.7	Complete any required pre-start checks
2	Operate leaching equipment	2.1	Identify the type of leaching equipment
		2.2	Start up and shut down leaching equipment according to the leaching equipment type and duty
		2.3	Adjust feed rate and reagents as appropriate to type of leaching equipment
		2.4	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends
3	Operate ancillary equipment	3.1	Monitor critical variables, such as amps, temperature and vibration
		3.2	Keep critical variables in range

		3.3	Recognise trends/patterns which indicate a potential or actual problem with the ancillary equipment
		3.4	Take appropriate action to ensure ancillary equipment is returned to full performance in a timely manner
4	Recognise problems and take appropriate action	4.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		4.2	Recognise developing situations which may require action
		4.3	Make appropriate adjustments to leaching equipment and duty
		4.4	Take other appropriate actions on leaching problems
		4.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
5	Isolate and de-isolate plant	5.1	Isolate plant
		5.2	Make safe for required work
		5.3	Check plant is ready to be returned to service
		5.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- efficient and effective operation of plant/equipment
- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to

the correct use of the equipment

- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- applying mathematics required for monitoring and responding to trends

Required knowledge

Required knowledge of leaching equipment principles and typical problems, to a level needed to control the operation, includes:

- principles of operation of leaching plant/equipment
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- physics and chemistry relevant to each unit and the processes used
- function and troubleshooting of major internal components and their problems, such as internals, supports, nozzles or agitators
- relevant environmental and heritage requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria required skills and knowledge range statement and the Assessment Guidelines for the Training Package.

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance

- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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.

Context

This competency includes all types of leaching equipment/processes, including but not limited to:

- acid
- alkaline
- bacterial leach
- dump (run of mine ore)
- heap (processed ore for leaching)
- in situ
- pressure

Ancillary equipment

Ancillary equipment may include, but is not limited to:

- agitators
- pumps

Procedures

- spray nozzles/heads

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- seal/gasket leaks
- pressure loss/low flow
- blockages/build-up/fouling
- erosion/wear
- ancillary equipment problems

Remedial actions

Remedial actions may include but are not limited to:

- making adjustments to the equipment (e.g. flow and pressure)

- carrying out minor maintenance within operator's skill level
- identifying and reporting problems outside operator's scope of ability
- identifying and controlling hazards related to leaching equipment and surrounding areas

Start up and shut down as required

Start up and shut down as required includes:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold or empty
- all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Work requirements

Work requirements may come from briefings, handovers and work orders and may include:

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions
- lighting conditions
- plant or equipment defects
- hazards and potential hazards
- coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS264A Operate solvent extraction equipment

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate typical solvent extraction equipment as used in a metalliferous minerals processing plant. It also includes solving problems with solvent extraction processes and the equipment, including any ancillary equipment.

Application of the Unit

This unit applies to a person who has the responsibility for starting up, shutting down and operating solvent extraction equipment to procedures; and making adjustments to flow rate, pressure and temperature of solvent extraction equipment.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit does not cover leaching equipment, which is instead covered by:

- *PMAOPS263A Operate leaching equipment.*

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of solvent extraction plant/equipment
		1.7	Complete any required pre-start checks
2	Operate solvent extraction equipment	2.1	Identify the type of solvent and solvent extraction equipment
		2.2	Start up and shut down solvent extraction equipment according to the solvent extraction equipment type and duty
		2.3	Adjust process variables as appropriate to type of solvent extraction equipment
		2.4	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends
3	Operate ancillary	3.1	Monitor critical variables

	equipment, as required	3.2	Keep critical variables in range
		3.3	Recognise trends/patterns which indicate a potential or actual problem with the equipment
		3.4	Take appropriate action to ensure equipment is returned to full performance in a timely manner
4	Recognise problems and take appropriate action	4.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		4.2	Recognise developing situations which may require action
		4.3	Make appropriate adjustments to solvent extraction equipment and duty
		4.4	Take other appropriate actions on solvent extraction problems
		4.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
5	Isolate and de-isolate plant	5.1	Isolate plant
		5.2	Make safe for required work
		5.3	Check plant is ready to be returned to service
		5.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- efficient and effective operation of plant/equipment

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge of solvent extraction equipment principles and typical problems, to a level needed to control the operation, includes:

- principles of operation of solvent extraction plant/equipment
- process parameters and limits
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- physics and chemistry relevant to each unit and the processes used
- function and troubleshooting of major internal components and their problems, such as internals, supports, pumps or agitators
- relevant environmental and heritage requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria required skills and knowledge range statement and the Assessment Guidelines for the Training Package.

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely

- return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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.

Context

This competency includes all types of solvent extraction equipment, including, but not limited to:

- mixer/settlers
- organic treatment units

Procedures

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions

- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Ancillary equipment variables

Ancillary equipment variables may include, but are not limited to:

- temperature
- amps
- pressure
- vibration

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- process leaks
- variations in throughput or feed
- blockages/build-up/fouling
- erosion/wear
- driver problems

Remedial actions

Remedial actions may include, but are not limited to:

- making adjustments to the equipment
- carrying out minor maintenance within operator's skill level
- identifying and reporting problems outside operator's scope of ability

	identifying and controlling hazards related to solvent extraction equipment and surrounding areas
Start up and shut down as required	Start up and shut down as required includes: - start up and shut down to/from normal operating conditions - start up and shut down to/from isolated, cold or empty - all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Work requirements	Work requirements may come from briefings, handovers and work orders and may include: - compliance documentation - product specifications - nature and scope of tasks - achievement targets - operational conditions - lighting conditions - plant or equipment defects - hazards and potential hazards - coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS265A Operate magnetic/electrical separation equipment

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate typical magnetic/electrical separation equipment as used in a chemical, oil/hydrocarbons or metalliferous minerals processing plant. It also includes solving problems with separation processes and the equipment, including the driver powering the separation equipment.

Application of the Unit

This unit applies to a person who has the responsibility for starting up, shutting down and operating separation equipment to procedures, and making adjustments to flow rate and pressure of the separation equipment.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit does not cover stand alone, non-powered dual phase separation equipment, powered separation equipment or chemical separation equipment, which are instead covered by:

- *PMAOPS246A Operate separation equipment*
- *PMAOPS247A Operate powered separation equipment*
- *PMAOPS208B Operate chemical separation equipment*

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of separation plant/equipment
		1.7	Complete any required pre-start checks
2	Operate magnetic/ electrical separation equipment	2.1	Identify the type of magnetic/electrical separation equipment
		2.2	Start up and shut down separation equipment according to the separation equipment type and duty
		2.3	Adjust process variables as appropriate to type of separation equipment
		2.4	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends
3	Operate drivers of separation	3.1	Monitor critical variables, such as amps, temperature and vibration

	equipment	3.2	Keep critical variables in range
		3.3	Recognise trends/patterns which indicate a potential or actual problem with the driver
		3.4	Take appropriate action to ensure driver is returned to full performance in a timely manner
4	Recognise problems and take appropriate action	4.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		4.2	Recognise developing situations which may require action
		4.3	Make appropriate adjustments to separation equipment and duty
		4.4	Take other appropriate actions on separation problems, as required
		4.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
5	Isolate and de-isolate plant	5.1	Isolate plant
		5.2	Make safe for required work
		5.3	Check plant is ready to be returned to service
		5.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- efficient and effective operation of plant/equipment

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge of separation equipment principles and typical problems, to a level needed to control the operation, includes:

- principles of operation of separation plant/equipment
- process parameters and limits
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- physics and chemistry relevant to each unit and the processes used, including kinetic energy effects
- function and troubleshooting of major internal components and their problems, such as internals, supports, belts, drums or scrapers
- relevant environmental and heritage requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria required skills and knowledge range statement and the Assessment Guidelines for the Training Package.

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined

- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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.

Context

This competency includes all types of magnetic/electrical separation equipment for gaseous, liquid and solids separation duties, including, but not limited to:

- low intensity magnetic separators
- high intensity magnetic separators
- wet drum magnetic separators
- cross belt magnets
- electrostatic separators

Procedures

Procedures may be written, verbal, computer-based or in some other form. They may include but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- variations in feed and throughput
- blockages/build-up/fouling
- erosion/wear
- separator driver problems

Remedial actions

Remedial actions may include, but are not limited to:

- making adjustments to the equipment
- carrying out minor maintenance within operator's skill level
- identifying and reporting problems outside operator's scope of ability
- identifying and controlling hazards related to separation equipment and surrounding areas

Start up and shut down as required

Start up and shut down as required includes:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold or empty
- all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Work requirements

Work requirements may come from briefings, handovers and work orders and may include:

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions
- lighting conditions
- plant or equipment defects
- hazards and potential hazards
- coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS280B Interpret process plant schematics

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the interpretation of process plant schematics for a range of operations uses. It includes a wide range of schematics.

Application of the Unit

Application of the unit	In a typical scenario, an operator needs to undertake an activity on the plant, or related to the plant and uses a schematic as an aid in interpreting the plant and/or the plant systems or as an aid to explaining the plant/plant systems to another person (who may be another operator, technical specialist, member of management, maintenance worker or contractor). The operator would: • find relevant information from the schematic • mark up a schematic for their own use or the use of another person • sketch a schematic, using relevant symbols, as part of an explanation to another person or as an <i>aide memoir</i> for themselves This competency covers all general and common symbols and also includes those specific to the relevant plant which is the operator's area of responsibility. It includes those conventions which are applied by their place of work.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Relate schematic to plant.	1.1. Match items on schematic with items in plant 1.2. Determine relevant pipe and flange schedules 1.3. Identify sizes and types of minor equipment 1.4. Locate relevant instrument tapping points and control points 1.5. Identify direction of flow on schematic and in plant.
2. Identify points required to prepare plant.	2.1. Locate isolation and blanking points for any item of the relevant schematic 2.2. Identify drain/vent/purge points for any item on the

ELEMENT	PERFORMANCE CRITERIA
	relevant schematic 2.3. Identify trip system elements 2.4. Use schematic to check/develop work lists.
3. Describe the process with a schematic.	3.1. Use a schematic as the basis of a description of the process 3.2. Describe the process using a manual schematic 3.3. Walk through process identifying all plant items in process order 3.4. Identify key conditions/variables from a relevant schematic.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- interpretation of symbols and other drawing elements
- communication
- problem solving

Required knowledge

Competence includes an understanding of process plant schematics and their application to the actual plant and process. In particular it includes a knowledge of:

- symbols used on schematics by that organisation
- schematic conventions, eg with particular reference to crossing and branching lines
- indications of equipment/pipe specifications
- indications of process conditions/limits
- cause and effect interpretation as relevant

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	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to apply schematics to plant/process based situations. Consistent performance should be demonstrated. In particular look to see that: - critical process/plant features can be identified from a schematic - main process features can be described using a schematic.
Context of and specific resources for assessment	Assessment will require access to a plant over an extended period of time, or a suitable method of gathering evidence of ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

RANGE STATEMENT	
Items	Items on schematic/in plant includes: • all major plant items such as: • vessels, • columns, • reactors • heat exchangers • minor plant items
Context	Schematics have various names and includes: • P&IDs (piping and instrumentation diagrams) • PFDs (process flow diagrams) • PEFs (Process Engineering Flow) • cause and effect diagrams/matrix Unless qualified in the unit, 'schematic' means a formally drawn, authorized schematic and may be hard copy or electronic.
Symbols	Symbols and conventions used in the schematics for the relevant plant area should be used. They may be Australian Standards symbols, the organisation's standard symbols or some other standard system:
Minor equipment	Minor equipment includes that equipment commonly described by size and type and includes: • pumps • valves • strainers • filters • instrumentation (local and remote) It typically would not include items such as vessels, columns, reactors or heat exchangers which would be major plant items.
Plant preparation	Plant preparation entails all that activity which may be required to render the plant safe for non-operational work (which is typically maintenance but may be other work) and includes: • isolations

RANGE STATEMENT	
	• blank/spade/spectacle blind, breakout spool locations • draining • purging • blanketing • venting • ventilating • locating plant, equipment and services - above ground • locating below ground (or otherwise obscured) pipeline and services.
Key conditions	Key conditions includes: • normal range of process conditions such as • level • pressure • flow • temperature • alarm conditions/values • trip, ESD values
Work lists	Work lists may include: • punch list • tag numbers • spade/blind lists • similar lists
Manual schematic	Manual schematic may include: • a hand drawn sketch of the part of the process of interest • a mark up of a formally drawn schematic Schematics may be hard copy or electronic.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred

RANGE STATEMENT	
	reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: - all work instructions - standard operating procedures - formulas/recipes - batch sheets - temporary instructions - any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS290B Operate a biotreater

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the operation of a biotreater which is typically used for the reduction of BOD in an aqueous waste stream.

Application of the Unit

Application of the unit	In a typical scenario, a plant produces an aqueous waste stream which has a high BOD/is contaminated with organic material. This waste stream is treated using a biotreater to produce a clean, low BOD effluent which is acceptable for discharge either to the sewer (as trade waste) or to a receiving waterway where it is within the environmental regulations/ license conditions. This unit includes the operation of all associated pumps, dosing pumps, agitation, aeration and similar equipment which is integral to the operation of the biotreater. The unit applies to any waste treatment facility using microorganisms to clean an aqueous stream. It includes biotreaters which use aerobic, anaerobic and/or facultative microorganisms This unit does not apply to other waste treatment equipment (such as filtration or chemical dosing) which would be covered by the relevant OPS unit. The significant factor with this unit is not that it is treating waste, but that it is using microorganisms to perform the treatment at ambient temperatures. For temperature controlled microorganism based processes see <i>PMAOPS390B Operate a biochemical process</i> The plant technician would: • identify and rectify operational problems • predict the potential impact of feed changes • facilitate feed changes This unit does not require the operation of a control panel - see relevant unit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Monitor and control the biotreater processes	1.1. Get information relevant to the operation of the biotreater 1.2. Identify changes in key variables 1.3. Keep feed as consistent as possible 1.4. Check performance of ancillaries such as agitation 1.5. Recognise and interpret trends in biotreater data/appearance 1.6. Recognise the signs of potential and actual problems 1.7. Identify the consequences to the biotreater processes of the identified changes, trends and problems 1.8. Take appropriate action to minimise the impact of potential and actual problems.
2. Ramp performance	2.1. Anticipate significant changes in feed

ELEMENT	PERFORMANCE CRITERIA
up/down.	2.2. Breed up/down biomass to prepare for change in feed by changing variables 2.3. Ramp changed feed at a rate suitable for the biotreater 2.4. Establish stable operation for new feed conditions.
3. Maintain effectiveness of biotreater system.	3.1. Frequently and critically monitor biotreater system throughout shift 3.2. Use measured/indicated data and smell, sight, sound and feel as appropriate 3.3. Identify critical equipment and processes 3.4. Identify issues likely to impact on the whole plant performance and take appropriate action 3.5. Predict impact of a change in the biotreater system on other plant units/areas and communicate this to relevant people 3.6. Predict impact of a change in the processing plant on the biotreater and take appropriate action 3.7. Test trips and alarms as required in liaison with the panel operator.
4. Manage impact of shutdowns on biotreater system.	4.1. Identify type of shutdown required/occurring 4.2. Identify impact of type of shutdown on biotreater 4.3. Liaise with appropriate people for shutdown 4.4. Arrange to maintain adequate feed to biotreater for a short plant shutdown 4.5. Arrange to preserve adequate seed stock of micro-organisms for long plant shutdown or shutdown of biotreater
5. Isolate and de-isolate biotreater.	5.1. Isolate biotreater or biotreater components 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare biotreater or plant component for return to service 5.5. Ramp biotreater back to normal operation..
6. Control hazards.	6.1. Identify hazards in biotreater work area 6.2. Assess the risks arising from those hazards 6.3. Implement measures to control those risks in line with procedures and duty of care.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- observation
- interpretation
- analysis.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the biotreater system and distinguish between causes of problems/alarm/fault indications such as:

- feed variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Required knowledge

Competence includes an understanding of the biotreater system and its integral equipment to the level needed to control the system and resolve problems, ie:

- identify all items on a schematic of the biotreater system and describe the function of each
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- state the biochemical changes which are occurring in each stage and the methods of controlling them
- describe methods of ramping up/down in response to feed changes and the advantages and disadvantages of each.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a

EVIDENCE GUIDE	
	manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources	Assessment will require access to an operating plant

EVIDENCE GUIDE	
for assessment	over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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 italicized 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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the biotreater system. For your plant this may include (select relevant items): • pumps (feed and dosing pumps) • utilities and services such as air • agitators • air/gas supply/removal • other equipment integral to the operation of the biotreater system.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes

RANGE STATEMENT	
	• rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Typical problems	Typical problems for your plant may include: • sudden changes in feed (rate, composition, concentration) • handling a plant shutdown without allowing the micro-organisms to die • control of degree of agitation • settling/removal/recycling of biosolids.
Key variables	Key variables include: • feed rate • feed composition • feed concentration • rapid changes in feed characteristic
Biomass variables	Biomass variables include: • nutrient dosing • aeration rate (if appropriate) • agitation rate
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS300B Operate a production unit

Modification History

Release 2 – Minor clarification to descriptor, minor changes to Skills and Knowledge and Range, and editorial corrections.

Unit Descriptor

This competency covers the operation of an enterprise specific unit of a production plant, which is not otherwise described by other units in this Training Package. The operations technician is expected to demonstrate a significant understanding of the process and the equipment operation. The plant unit includes the operation of other plant items which are integral to the operation of the plant unit.

Application of the Unit

This unit applies where the plant technician operates a unit of plant which is not otherwise described. The other 300 series process competencies should be used as an indicative guide as to the coverage and complexity of the operation.

The operations technician would:

- identify and rectify operational problems
- predict the potential impact of the production unit output on the operation of the whole plant
- facilitate output changes.

Generally the operations technician would operate independently in a plant with local control or in liaison with the control room operator in a plant with Distributed Control System (DCS) type controls. In the case of large complex plant, the operations technician would be part of a team during startup and shutdown procedures. The operations technician would be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does not include the operation of any packaged unit (regardless of its engineering complexity) which is covered by *MSAPMOPS100A Use equipment*.

This unit does not require the operation of a central control panel.

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
2	Start up unit	2.1	Perform pre-start-up checks
		2.2	Start up individual items of equipment and the entire unit
		2.3	Start up normally and after maintenance
		2.4	Build rate steadily
		2.5	Stabilise operation to produce specified rate and quality within minimum time
3	Monitor and control the unit	3.1	Complete routine checks, logs and paperwork
		3.2	Frequently and critically monitor all plant throughout shift
		3.3	Recognise the signs of potential and actual problems

	3.4	Take appropriate action
	3.5	Trim plant to achieve required output rate and quality while maximising plant efficiency
4	Change unit output rate, grade or specification	
	4.1	Predict the need to make a change to meet process requirements
	4.2	Trim unit in preparation of changes
	4.3	Make changes as required
	4.4	Manage changes smoothly and in a timely manner
	4.5	Minimise out of specification product/process disruptions as a result of the change
5	Maintain plant effectiveness	
	5.1	Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant
	5.2	Identify critical equipment/processes and tune their performance
	5.3	Identify issues likely to impact on plant performance and take appropriate action
	5.4	Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people
	5.5	Test trips and alarms as required
	5.6	Complete minor maintenance according to procedures
6	Shut down unit	
	6.1	Determine type of shut down required
	6.2	Give advance warning of shut down where possible
	6.3	Change over individual items of equipment
	6.4	Shut down individual items of equipment and the entire unit
	6.5	Shut down to a standby condition if appropriate

	6.6	Shut down in an emergency and otherwise when required
	6.7	Reset trips and alarms after a shutdown
7	Isolate and de-isolate plant	
	7.1	Isolate plant
	7.2	Make safe for required work
	7.3	Check plant is ready to be returned to service
	7.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

For the plant system:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving

Also ability to:

- identify all items on a schematic of the production unit and describe the function of each
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- describe the basis of the process used in the production unit to transform the feed materials into the product, including the basic science of the process (where relevant)
- describe the causes and remedies of common problems, such as those selected in the Range Statement
- describe methods of changing rate/grade/specification or feed and the advantages and disadvantages of each

Ability to isolate the causes of problems to an item of equipment within the production unit and to be able to distinguish between causes of problems/alarm/fault indications, such as:

- process materials variations
- instrument failure/wrong reading
- electrical failure

- mechanical failure
- operational problem,

as is relevant to the practical operation of equipment at that job level

Required knowledge

An understanding of the production unit/system and its integral equipment, to the level needed to control the system and recognise and resolve problems. In particular it includes:

- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit
- process parameters and limits (e.g. temperature, pressure, flow, pH and amps)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility

This knowledge is required of all major items of equipment which comprise the production unit/system.

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.

Overview of assessment Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components.

Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Context of and specific resources for assessment

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Method of assessment

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- *MSAPMOHS200A Work safely.*

Guidance information

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy

for assessment capacity of the assessee 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. 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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency covers the operation of a unit of equipment and includes the operation of equipment ancillary to the main production unit. It includes all items of equipment and unit operations which form part of the operation of the unit.
Problems	Typical problems include: • recognising and acting on unstable/sub-optimal operation • control of critical variables and outputs • variations in feed rates, quality, and so on
Start up shut down as required	Start up shut down as required includes: • start up and shut down to/from normal operating conditions • start up and shut down to/from isolated, cold or empty • all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions

- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations.

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Product

Product includes anything produced by a process step and so includes intermediate products, such as the product from one process step which then becomes the feed for another'.

Unit Sector(s)

Operational/technical

Competency field

Not applicable

Co-requisite units

Not applicable

PMAOPS301B Produce product by distillation

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the monitoring and controlling of a distillation unit, which is separating two or more components to achieve finished product, which meets a predetermined specification. The process may or may not be controlled from a central control room.

Application of the Unit

Application of the unit	In a typical scenario an operations technician would be monitoring and controlling the distillation section of a plant from a central control room. The process may involve one or more distillation columns and their associated equipment, piping and controls. The distillation column may be trayed or packed and may be performing cryogenic gas distillation, liquid distillation, azeotropic distillation, fractional distillation, vacuum distillation or molten metal distillation. Each tower may be provided with: • reboiler/heater • feed at an appropriate temperature • over head product condenser • reflux equipment • tower internals • instrumentation. The operations technician will be able to: • identify and correct operational problems • determine the impact of composition changes and adjust accordingly • direct members of the operational team under start-up and running conditions. Generally the operations technician would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would

	be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Start up distillation system.	2.1. Perform pre-start up checks 2.2. Bring into operation equipment required for distillation 2.3. Correctly sequence all equipment required before commencing the process

ELEMENT	PERFORMANCE CRITERIA
	2.4. Monitor temperature increase during start up and take appropriate action 2.5. Stabilise distillation system to produce specified rate and quality within minimum time.
3. Monitor distillation process.	3.1. Continually monitor process systems to ensure that product specifications are maintained 3.2. Minimise the risk of product specification deviations during the process by applying process knowledge 3.3. Adjust process variables to ensure the product remains within specification 3.4. Identify issues likely to impact on plant performance and take appropriate action 3.5. Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people 3.6. Record product movements as a historical record of the quantity and quality of the finished product.
4. Change production rates and/or product specification.	4.1. Predict the need to make change to meet process requirements 4.2. Manipulate unit temperatures to achieve product specifications 4.3. Trim plant in a manner which prepares it for the transition 4.4. Manage transitions smoothly and in a timely manner 4.5. Minimise out of specification material as a result of a transition.
5. Shut down distillation systems.	5.1. Determine type of shut down required 5.2. Give advanced warning of shut down where possible 5.3. Change over individual items of equipment 5.4. Shut down individual items of equipment and the entire reaction system 5.5. Shut down to a stand-by condition if required 5.6. Shut down in an emergency when required 5.7. Reset trips and alarms after a shut down 5.8. Leave plant in a condition ready to restart 5.9. Make plant safe for maintenance work where required.
6. Prepare distillation unit for maintenance.	6.1. Inform plant personnel of impending maintenance activity 6.2. Prepare unit for maintenance/vessel entry as required

ELEMENT	PERFORMANCE CRITERIA
	according to procedures 6.3. Test trips and alarms as required 6.4. Accept plant back from maintenance 6.5. Prepare plant for the introduction of process materials and operation.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the distillation system and to distinguish between causes of problems/alarm/fault indications such as:

- process feed variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- process control philosophies and strategies
- outside process/production operations, including column, tray/packing and reboiler operations, and distillation principles (including stripping and rectification)
- heating and cooling principles
- stabilisation principles

REQUIRED SKILLS AND KNOWLEDGE

- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of distillation units and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can

EVIDENCE GUIDE	
	be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: • <i>PMAOPS201B Operate fluid flow equipment</i> • <i>PMAOPS222B Operate and monitor pumping</i>

EVIDENCE GUIDE	
	<i>systems and equipment</i> <i>PMAOPS205B Operate heat exchangers.</i> In a major hazard facility, it may be appropriate to assess this unit concurrently with: <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: - determining problems needing action - determining possible fault causes - rectifying problem using appropriate solution within area of responsibility - following through items initiated until final resolution has occurred - reporting problems outside area of responsibility to designated person.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the distillation system. For your plant this may include (select relevant items): - columns/towers - trays/packing - boilers/reboilers - condensers - heat exchangers

RANGE STATEMENT	
	• refrigerant compressors • pumps • valves. Typical problems for your plant may include: • flooding • channelling (packed column) • dumping • entrainment.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units	<i>PMAOPS201B</i>	<i>Operate fluid flow equipment</i>
	<i>PMAOPS205B</i>	<i>Operate heat exchangers</i>

PMAOPS302B Operate reactors and reaction equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	Typically an operations technician would be looking after the operation of a production unit which, as its prime function, causes and controls a chemical reaction. It includes the operation of equipment ancillary to the main reactor. The reactor or reaction equipment includes types of reactors such as: • batch • continuous • catalytic • fluidised bed.

Application of the Unit

Application of the unit	The plant technician would: • identify and rectify operational problems • run all aspects of the reactor operation, including start-up and shut down • monitor and manage the supply of raw materials and output of product • adjust product properties to meet specifications. Generally the plant technician would operate independently in a plant with local control or in liaison with the control room operator in a plant with centralised/distributed control system (DCS) type controls. The plant technician would be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Start-up reaction systems.	2.1. Perform pre-start-up checks 2.2. Start up individual items of equipment and the entire reactor system 2.3. Start up from standby and after maintenance 2.4. Build reaction rate steadily and take appropriate action on deviations 2.5. Stabilise reaction system to produce in specification product at specified rates within minimum time.
3. Monitor and control the reaction process.	3.1. Complete routine checks logs and paperwork 3.2. Recognise the signs of potential and actual problems 3.3. Take appropriate action to minimise the impact on safety, health, the environment and the business of potential and actual problems 3.4. Monitor condition of catalyst (if appropriate) and

ELEMENT	PERFORMANCE CRITERIA
	take action to maintain production schedule and quality 3.5. Monitor materials and stock levels of feeds and take action to maintain production schedule and quality 3.6. Trim plant to achieve required rates and quality while maximising plant efficiency.
4. Change production rates and/or product grade/specification.	4.1. Predict from rates and schedule when a transition will be required 4.2. Give advanced notice of transition to work team 4.3. Trim plant in a manner which prepares it for the transition 4.4. Manage transitions smoothly and in a timely manner and take appropriate action to achieve this 4.5. Minimise scrap/off grade as a result of a transition.
5. Maintain plant effectiveness.	5.1. Frequently and critically monitor all plant throughout shift 5.2. Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant 5.3. Identify critical equipment/processes and tune their performance 5.4. Identify issues likely to impact on plant performance and take appropriate action 5.5. Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people 5.6. Take appropriate action to maintain plant effectiveness.
6. Shut down reaction systems.	6.1. Determine type of shut down required 6.2. Give advance warning of shut down where possible 6.3. Change over individual items of equipment 6.4. Shut down individual items of equipment and the entire reaction system 6.5. Shut down to a stand-by condition if required 6.6. Shut down for maintenance when required. 6.7. Shut down in an emergency when required
7. Clean reactors/vessels.	7.1. Identify cleaning requirements 7.2. Clean to requirements according to procedures.
8. Isolate and de-isolate reactor.	8.1. Isolate plant 8.2. Make safe for required work

ELEMENT	PERFORMANCE CRITERIA
	8.3. Check plant is ready to be returned to service 8.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of reactor and ancillary plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Also the ability to:

- identify all items on a schematic of the reaction system and describe the function of each
- distinguish between elements, compounds and mixtures in their raw materials and products
- describe the nature/condition of materials at each stage of the reaction, the changes which have occurred in that stage and why they have occurred
- describe reaction in chemical terms, including the effect of changing reaction variables, eg temperature, pressure, catalyst, concentration, pH
- describe the reaction(s) using appropriate chemical equations
- state the type of reactor(s) used and their characteristics (advantages and limitations)
- describe the methods of controlling the reaction, including rate and yield.

Required knowledge

Competence includes an understanding of the reaction system and its integral equipment to the level needed to control the system and recognise and resolve problems. In particular this includes:

- principles of operation of reactor and ancillary plant/equipment
- physics and chemistry relevant to the process and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution

REQUIRED SKILLS AND KNOWLEDGE

- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In

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	particular look to see that: - early warning signs of equipment/processes needing attention or with potential problems are recognised - the range of possible causes can be identified and analysed and the most likely cause determined - appropriate action is taken to ensure a timely return to full performance - obvious problems in related plant areas are recognised and an appropriate contribution made to their solution These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with: <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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	
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.	
Codes of practice/ standards	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 all such items of equipment and unit operations which form part of the reaction system. Typically this will include: • pumps • valves • mixers and • heat exchangers/jackets/coils. and may also include other equipment as well as the reaction vessel itself.
Typical problems	Typical problems include: • variations in catalyst activity • control of exotherm/endothrm • adjustments to meet product specifications • variations in feed rates/quality. • raw materials variations • instrument failure/wrong reading • equipment failure (electrical/mechanical) • mechanical failure • operational problems.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions

RANGE STATEMENT

	• standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Plant technicians should be able to determine safe working practice using the relevant materials safety data sheets (MSDSs).

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS303B Operate furnaces to induce reaction

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the operation of furnaces for the primary purpose of causing, inducing or facilitating a chemical reaction such as cracking, smelting or other very high temperature processes. The furnace will typically be directly fired, or may use the feed as the fuel. It does not apply to steam heated reactors.

Application of the Unit

Application of the unit	In a typical scenario, an operating technician in a plant looks after the operation of a furnace, which may be used to cause and control the cracking of oil or gas, the smelting of ore or other process function. The furnace is not used primarily to generate heat or raise steam, but rather to cause a chemical change which requires high temperatures (and which may or may not be assisted by other means). The generation of heat as a by-product which may be used elsewhere is not precluded. It includes the operation of equipment ancillary to the main furnace. This competency unit covers furnaces and furnace processes such as: • thermal cracking • catalytic cracking • reduction • cabin type • cylindrical or vertical. It does not include: • packaged furnaces which are covered by MSAPMOPS100A Use equipment • furnaces used for the production of steam, which are covered by <i>MEM07033B Operate and monitor basic boiler</i> or <i>MEM07034A Operate and monitor intermediate class boiler</i> • furnaces used for heating heat transfer fluids (eg 'Dowtherm') which are covered by PMAOPS323B Operate and monitor heating furnace.

	The plant technician would: • identify and rectify operational problems • predict the potential impact of furnace output on the operation of the whole plant • facilitate output changes. Generally the plant technician would be part of a team during start-up and shutdown procedures and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Start up furnace.	2.1. Perform pre-start-up checks 2.2. Start up individual items of equipment and the entire furnace system 2.3. Start up from standby and after maintenance 2.4. Build production rate steadily with no surges or lulls 2.5. Stabilise system to produce in specification product at specified rates within minimum time.
3. Monitor and control the reaction process.	3.1. Complete routine checks, logs and paperwork 3.2. Recognise the signs of potential and actual problems 3.3. Take action to minimise the impact on safety, health, the environment and the business of potential and actual problems 3.4. Monitor condition of catalyst (if any) and take action to maintain production schedule and quality 3.5. Monitor availability of feeds and take action to maintain production schedule and quality 3.6. Remove product as appropriate 3.7. Trim plant to achieve required rates and quality while maximising plant efficiency.
4. Change production rates and/or product specification.	4.1. Predict from rates and schedule when a transition will be required 4.2. Give advanced notice of transition to work team 4.3. Trim plant in a manner which prepares it for the change 4.4. Manage changes smoothly and in a timely manner 4.5. Minimise off grade as a result of a transition.
5. Maintain plant effectiveness.	5.1. Frequently and critically monitor all plant throughout shift 5.2. Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant 5.3. Identify critical equipment/processes and tune their performance 5.4. Identify issues likely to impact on plant performance and take appropriate action 5.5. Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people

ELEMENT	PERFORMANCE CRITERIA
	5.6. Test trips and alarms 5.7. Complete minor maintenance according to procedures.
6. Shut down furnace.	6.1. Determine type of shut down required 6.2. Give advance warning of shut down where possible 6.3. Change over individual items of equipment 6.4. Shut down individual items of equipment and the entire furnace system 6.5. Shut down to a stand-by condition if required 6.6. Shut down in an emergency when required 6.7. Prepare plant for maintenance/vessel entry as required 6.8. Receive plant back from maintenance 6.9. Reset trips and alarms after a shut down 6.10. Prepare plant for the introduction of hydrocarbons and operation 6.11. Leave plant in a condition ready to restart.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

This competency requires skills in:

- monitoring
- observation
- analysis

following procedures

Competence also includes the ability to isolate the causes of problems to an item of equipment within the furnace system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- process materials variations
- chemical processes (including combustion)
- instrument failure/wrong reading
- equipment (mechanical/electrical problems)
- operational problem
- as is relevant to the practical operation of equipment at that job level.

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Competence includes an understanding of the furnace system and its integral equipment to the level needed to control the system and recognise and resolve problems; in particular:

- all items on a schematic of the furnace system and the function of each, including furnace components such as:
 - burner
 - convection section
 - radiation section
 - floor/walls including insulation (refractory)
 - stack/damper (flue type)
- the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- the principles of operation of the furnace, including combustion principles, draft, burner design, excess air/flue CO/CO₂
- the importance of flame patterns/flame impingement
- the causes and remedies of common problems
- methods of changing rate and the advantages and disadvantages of each
- the chemistry of the reaction(s) occurring in the furnace to the level of writing equations and identifying and manipulating variables which control rate and yield.

This knowledge is required of all major items of equipment which comprise the furnace system.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of

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	parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable

EVIDENCE GUIDE	
	actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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	
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.	
Codes of practice/ standards	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 all such items of equipment and unit operations which form part of the furnace system. Typically this may include: • pumps • valves • utilities and services • heat exchangers and/or scrubbers • fuel systems • tapping systems and may also include other equipment as well as the furnace itself.
Typical problems	Typical problems include: • soot blowing

RANGE STATEMENT	
	• control of draft, fuel and air • variations in catalyst activity (where appropriate) • control of temperature and cracking/product rate/quality • variations in feed rates/quality.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS304B Operate and monitor compressor systems and equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the operation and monitoring of a complex compressor system and associated equipment.

Application of the Unit

Application of the unit	In a typical scenario, an operations technician in a large plant looks after the operation of a complex compressor system. At the heart of the compressor system would be a reciprocating or rotary (screw or centrifugal) compressor capable of high pressure and high volume. These compressors would be distinguished by features such as: • multistage compression • intercoolers • advanced lubrication and seal systems • surge control systems. The operations technician would: • identify and rectify operational problems • predict the potential impact of compressor output on the operation of the whole plant • facilitate output changes. Generally the operations technician would be part of a team during start-up and shutdown operations. They would be expected to be capable of performing all parts of this unit. At all times they would be liaising and communicating with relevant team members. This unit does not: • require the operation of a central control panel • apply to a packaged compressor, regardless of how large it may be, which is covered by <i>MSAPMOPS100A Use equipment</i>.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Start up compressor systems/ equipment.	2.1. Perform pre-start-up checks 2.2. Check the status of the system/equipment prior to commencing start-up process 2.3. Check all required auxiliary systems, including oil and water, to confirm their operational condition 2.4. Start up individual items of equipment and the entire compressor system as required 2.5. Bring the system to required operating conditions.
3. Control and monitor the	3.1. Initiate load-up through the selection of appropriate

ELEMENT	PERFORMANCE CRITERIA
compressor system.	speed or cycle 3.2. Monitor and adjust downstream equipment as required 3.3. Monitor the operational condition and safety status of the unit/system and take appropriate action 3.4. Adjust operational speeds and operating cycles as required 3.5. Monitor or activate safety systems to ensure that any system shutdowns are controlled and conducted safely and effectively.
4. Shut down compressor systems/equipment.	4.1. Confirm shutdown cause with other personnel and plant operators before commencing to isolate or shut down the equipment/system 4.2. Implement control measures to minimise damage and hazards 4.3. Shut down system according to procedures 4.4. Inspect the system/equipment as required by procedures 4.5. Isolate and purge systems/equipment and prepare plant for maintenance as required.
5. Maintain plant effectiveness.	5.1. Frequently and critically monitor all plant throughout shift 5.2. Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant 5.3. Identify critical equipment/processes and tune their performance 5.4. Identify issues likely to impact on plant performance and take appropriate action 5.5. Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people 5.6. Test trips and alarms as required

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Competence includes:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving

Competence also includes the ability to isolate the causes of problems to an item of equipment within the compressor system and to distinguish between causes of problems/alarm/fault indications such as:

- process gas variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.
- physics and chemistry relevant to the process unit and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- principles of operation of plant/equipment
- power and torque envelopes
- compression flows and characteristics
- liquid and product separation principles
- product characteristics and tolerances
- flow charts
- flow, pressure, temperature, levels and rates.

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of the compressor system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes

EVIDENCE GUIDE	
	needing attention or with potential problems are recognised - the range of possible causes can be identified and analysed and the most likely cause determined - appropriate action is taken to ensure a timely return to full performance - obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: <i>PMAOPS221B Operate and monitor prime movers</i> <i>PMAOPS223B Operate and monitor valve systems.</i>
Guidance information for assessment	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

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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the compressor system. For your plant this may include (select relevant items): • single/multi-stage rotary compressors (axial flow, centrifugal, turbine, screw) • single/multi-stage reciprocating compressors • turbo expanders/compressors • advanced lube and seal oil systems • intercoolers/heat exchangers • scrubbers • instrument/control systems • programmable logic controllers (PLCs) • process controllers. Typical problems for your plant may include: • surging • control of temperature and pressure • variations in feed • vibration.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes

RANGE STATEMENT	
	• batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units	<i>PMAOPS221B</i>	<i>Operate and monitor prime movers</i>

PMAOPS305B Operate process control systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the operation of a centralised control panel. These controllers use a range of control algorithms and multiple control loops. The panel will control multiple vessels/plant items and or products. It will typically be located off plant in a control room.

Application of the Unit

Application of the unit	In a typical scenario an operations technician uses a centralised process control system to operate and monitor the plant. This control system would typically be a distributed control system (DCS) and may include other local controllers which are integral to its operation (stand alone local controllers are covered by <i>PMAOPS216B Operate local control system</i>). This panel technician/central control room operator has an overall responsibility for the operation of all units of equipment covered by the control system. As such they often also take a lead role as part of the operating team. Competencies required by this role other than panel competencies as such are not covered by this unit. The operations technician would: • identify, correct and report operational problems • be aware of and contribute to a safe working environment • contribute to the safe and productive operation of the system • operate, monitor and maintain equipment using relevant procedures • take appropriate action following an alarm or out of specification condition developing Generally the operations technician would be part of a team during start up, shut down and normal operating conditions and would be expected to be capable of demonstrating competence in all parts of this unit. He/she would be taking a leading role in liaising and cooperating with other members of the team. Typically the panel operator will liaise with other 'outside operators', however this unit does not preclude the situation where the panel operator may also undertake 'outside' functions.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Use operator interface.	2.1. Use keyboards, track ball and monitor and/or stand alone controllers to access control system/panel 2.2. Monitor the process using the operator interfaces 2.3. Select appropriate controller modes 2.4. Access historical data and information 2.5. Acknowledge messages and alarms.
3. Access control information.	3.1. Obtain relevant data and information from the control

ELEMENT	PERFORMANCE CRITERIA
	system by applying systems knowledge 3.2. Identify the status of individual pieces of equipment from the control panel and use information to identify potential faults 3.3. Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics 3.4. Record process variations/irregularities to procedures.
4. Control process variations and monitor operations.	4.1. Use historical data to assist the identification of problems 4.2. Process available information to identify potential faults 4.3. Undertake required set point/output changes to meet plant and process requirements 4.4. Optimise plant operating conditions in accordance with guidelines 4.5. Adjust production in response to test results and control panel information 4.6. Monitor key process and environmental variables and take appropriate action 4.7. Adjust controller settings in accordance with procedures 4.8. Use fine tuning software as appropriate 4.9. Coordinate with up stream and downstream units as appropriate 4.10. Record adjustments and variations to specifications/schedules 4.11. Communicate to appropriate personnel as required.
5. Facilitate planned and unplanned process start-ups and shut-downs.	5.1. Select and apply procedures to planned startup and shutdown processes 5.2. Select and apply procedures to unplanned shutdown processes 5.3. Implement all required emergency responses 5.4. Communicate necessary information to all personnel affected by events 5.5. Log all required information.
6. Respond to alarms or out of specification conditions.	6.1. Identify system(s) affected by the alarm or condition 6.2. Interpret alarms and prioritise actions to be taken 6.3. Take appropriate action to respond to the alarm or

ELEMENT	PERFORMANCE CRITERIA
	incident 6.4. Deal with any out of specification material in accordance with procedures 6.5. Communicate the problem/solution to appropriate personnel 6.6. Record the information as required 6.7. Provide details of the alarm and action taken to the next shift at change over

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies
- product parameters (temperature, flows, pressure and levels)
- process control system malfunction
- power/utility failures.

An ability to communicate with other work groups and personnel during the operation and monitoring of this panel is considered an essential Element of this unit of competency.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- the architecture and location of the process/production equipment
- specific plant process operations
- interactions between plant items/processes
- product specifications and tolerances
- systems operating parameters
- system integrity limits
- process control philosophies and strategies
- emergency shutdown procedures

REQUIRED SKILLS AND KNOWLEDGE

- process specific physics, chemistry and mathematics
- basic science of upstream and downstream processes
- relevant chemistry of the process to the level of interpreting chemical equations and manipulating factors controlling rate of reaction and yield (or equivalent physics for a physical process/biochemistry for a biochemical process) - chemistry to include both intended products and interfering reactions, eg salts, hydrates
- impact of external factors, eg variations in weather, feed etc
- process drawings, eg P&ID, PFD
- cause and effect
- basis of control for the plant/s
- instrumentation and control systems, including feed forward, feed back and open control
- instrumentation and control system components, eg relevant primary sensing devices, final control elements, transducers/transmitters
- control loops, including PID control, set points, controlled variable, indicated variable
- interaction between multiple control loops, including cascade control
- impacts of changing controller settings and the limits within which changes can be made
- effective communication techniques
- organisation procedures
- UPS and its applications and use.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may

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	also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practiced in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of the process control system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responses. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to a process control system over an extended period of time, or a suitable

EVIDENCE GUIDE	
	method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, communication and leadership units.
Guidance information for assessment	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	
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 italicized 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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the control system. For your control room this may include (select relevant items): • process control systems, eg Distributed Control Systems • personal computers • printers • fire and gas detection/protection systems • emergency shutdown systems • communications systems. Typical problems for your plant may include: • loss of power/utilities • analysing failure modes

RANGE STATEMENT	
	• variation/loss of feed • unstable control of pressure, temperature level and flows • control equipment failure • process plant trips • change in atmospheric conditions (rain, temperature, wind, lightning) • emergency situations.
Alarms or abnormal conditions	Alarms or other abnormal conditions includes: • emergency, including emergency shut down • partial or complete controller failure.
Other problems	Other problems includes: • problem solving control functions
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS307B Transfer bulk fluids into/out of storage facility

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario involving land based tank farms or tankers at sea, the control room operator, from the main panel, will monitor and control the transfer of product into storage facilities including controlling product levels, flows, temperatures and pressures. The operations technician will also prepare and complete all necessary documentation for the control, transfer and calculation of product volumes.

Application of the Unit

Application of the unit	The storage facility or vessel will be monitored through the use of gas and fire detection equipment. Automatic sprinkler systems or deluges will be activated in the event of fire detection and emergency shutdown systems will operate. The equipment to be used in the transfer of product will be checked and tested before use. In some cases, before transferring, the circulation of product through pipelines, will commence. This is usually for the purpose of pipeline chilldown, and is required to minimise vapour pressure build-up in warm pipework. A comprehensive fire water supply main may encompass the facility and/or be located on the vessel, and a suitable fire pump would be able to provide fire water requirements in emergencies.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	PMAOPS201B	Operate fluid flow equipment

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare storage/transfer facilities	2.1. Manage products within the tank farm or at the platform in accordance with the site/enterprise's storage types, products and locations 2.2. Inspect storage or docking facilities for leaks or damage 2.3. Check and test safety systems to verify their operational condition and status, and report on all equipment faults 2.4. Conduct critical inspections of storage and tank farms (and ascertain seaworthiness of vessels at sea if required) ensuring areas are safe, clean and equipment can't be compromised by debris 2.5. Identify and report all equipment requiring maintenance, follow up to satisfactory conclusion.
3. Monitor storage facilities.	3.1. Confirm tank mixes, capacities and quality, and determine if these are being maintained within the agreed product requirements prior to transfer 3.2. Monitor gas detection/environmental/safety systems to ensure the storage area is a safe environment and that the safety of the area or vessel is not compromised 3.3. Communicate storage conditions to transfer or other personnel to inform them of the operational condition and status of the storage facilities or vessel.

ELEMENT	PERFORMANCE CRITERIA
4. Monitor load-out/transfer platform or facility as required.	4.1. Monitor load-out/transfer systems on the platform or in the terminal load-out/transfer area 4.2. Monitor gas detection/environmental/safety systems to ensure the load-out/transfer area is a safe environment 4.3. Inform appropriate personnel of the load-out/transfer area status, and conditions of the storage facilities.
5. Conduct load-out/transfer.	5.1. Communicate operational status to required personnel prior to loading 5.2. Ensure that all start-up permissives have been satisfied and product is ready for transfer 5.3. Set and adjust pump flow rates to keep within agreed capacities 5.4. Monitor loading pump performance to keep within stated operational ranges and vibration is in limits 5.5. Take and record product shipping/transfer samples as required.
6. Isolate and de-isolate plant.	6.1. Isolate plant 6.2. Make safe for required work 6.3. Check plant is ready to be returned to service 6.4. Prepare plant for return to service.
7. Resolve problems	7.1. Identify possible problems in equipment and process. 7.2. Determine problems needing action 7.3. Determine possible fault causes 7.4. Rectify problem using appropriate solution within area of responsibility 7.5. Follow up items until resolved 7.6. Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

For the plant system/unit:

REQUIRED SKILLS AND KNOWLEDGE

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving

Required knowledge

Demonstration of competence in this unit must include knowledge of the following:

- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling flow
- causes of head loss in piping systems, including comparison of fittings using Le/d concept, fluid and pipe material properties, flow geometry etc
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems, such as impellers, seals or bearings
- types and causes of problems within operator's scope of skill level and responsibility.
- testing techniques
- equipment isolation and purging
- use and operation of safety equipment, including breathing apparatus
- tank and product mixes
- flow rates and measures
- tank capacities and percentages
- static electricity principles.

Sound knowledge of storage and transfer techniques required to transport oil, gas or water is expected.

Evidence Guide**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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant or platform and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

EVIDENCE GUIDE	
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all items of equipment and unit operations which form part of the load-out and storage system. For your facility this may include (select relevant items): • tanks, such as concrete bunded storage tanks, atmospheric pressure tanks, floating roof tanks, temperature controlled tanks (heated, chilled, refrigerated) • vessels, eg pressure storage vessels • pumps, eg transfer and circulation pumps, stripping pumps • compressors, eg boil-off gas compressors • gauges

RANGE STATEMENT	
	• fire protection and deluge systems, eg flare system • gas detection systems and equipment • tank dipping and measurement equipment. • instrumentation.
Safety equipment	Safety equipment on site may include: • main fire pumps • jockey pumps • fire monitors • deluge systems • sub-surface foam injection • gas detection and reporting systems • fire detection and reporting systems • emergency shutdown systems
Products	Products may include hydrocarbons, oil, gas or bulk liquid chemicals/petrochemicals.
Problems	Typical problems for your facility may include: • insufficient/inappropriate storage for product/material • interruptions to loading through adverse weather conditions • product surging • control of temperature and pressure • variations in feed • vibration • tank capacities and space.
Start up shut down as required	Start up shut down as required includes: • start up and shut down to/from normal operating conditions • start up and shut down to/from isolated, cold, empty • all other conditions experienced on the plant. ie from any condition to any condition experienced on the plant.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form.

RANGE STATEMENT	
	They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS308B Organise storage and logistics of general materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the operation of the materials storage and retrieval system. In a typical scenario, an operations technician organises the storage and logistics of general materials for the plant or work area.

Application of the Unit

Application of the unit	The operations technician would: • determine the storage requirements for materials • follow requirements of the codes of practice, regulations or statutory requirements in the handling and storage of general materials • use product and hazard knowledge to contribute to the solving of operational problems to do with the handling and storage of materials. Generally the operations technician would be part of a team and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not apply to the storage and handling of bulk materials. See <i>PMAOPS307B Transfer bulk fluids into/out of storage facility</i> and <i>PMAOPS309B Operate particulates handling/storage equipment</i>. Whilst this competency includes the storage and handling of hazardous and dangerous materials, the handling of emergencies is covered by other competencies, for example <i>MSAPMOHS110A Respond to emergency situation</i>.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Categorise materials.	2.1. Locate storage and handling information for the materials, including hazardous and dangerous goods information, using labels, inventory system or other sources of information 2.2. Interpret storage, handling and hazards information from information sources 2.3. Categorise materials in terms of frequency of use (pick), handling requirements, sources and destination points (internal and external), security requirements, product life and location in the storage area.
3. Select storage location and method.	3.1. Determine storage location for materials based on hazardous or dangerous goods, composition, state of the materials and containers, temperature or light control, fragility, quantity, size or shape 3.2. Determine storage requirements for new materials based on information available and recommend requirements

ELEMENT	PERFORMANCE CRITERIA
	3.3. Assist others with advice concerning the storage and handling of materials based on the information available.
4. Store and retrieve materials.	4.1. Determine appropriate transport and handling requirements for materials 4.2. Move materials to and from storage areas, using appropriate handling methods 4.3. Update relevant stock records and documentation as required 4.4. Advise of material stock status, stock-outs or oversupply to relevant personnel 4.5. Contribute to the logistics management process by supply of accurate stock information, movement and advice on storage requirements and capacity.
5. Resolve problems.	5.1. Identify possible problems in equipment or process 5.2. Determine problems needing action 5.3. Determine possible fault causes 5.4. Rectify problem using appropriate solution within area of responsibility 5.5. Follow through items initiated until final resolution has occurred 5.6. Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Ability to isolate the causes of problems to a component of the logistics system and to distinguish between causes of problems such as:

- missing or damaged labels
- new materials requiring information about storage and handling to be found from additional information sources
- special location requirements for materials.

Required knowledge

- Understanding of the logistics system, procedures and requirements to the level needed to use the system and recognise and resolve problems. In particular it includes the ability to:
- locate, interpret and apply relevant information

REQUIRED SKILLS AND KNOWLEDGE

- provide customer service (both internal and external) and work effectively with others
- apply knowledge of regulations and legislation to the storage and handling of materials
- determine material type, location, handling and transport requirements using information sources and systems
- safely move materials to the appropriate areas.

Knowledge of the materials, labeling and their storage requirements

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery

EVIDENCE GUIDE	
	from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of materials, storages or information needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas and systems are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It may be appropriate to assess this unit concurrently with <i>TDTD1097B Operate a forklift</i> .
Guidance information for assessment	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

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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all types of storage. For your plant this may include (select relevant items): • bins and binning systems • racks and racking systems • marked floor spaces • pallets, collapsible bins, portable tanks • specialised storage areas (bunds, secure, weather protected, heated, cooled).
General materials	General materials include: • raw materials and finished goods • materials in sacks, bags, drums and portable storage containers • hazardous and dangerous goods
Sources of Information	Information in support of storage and handling processes may be from many sources. For your plant this may include (select relevant items): • goods identification number and codes • manifests • picking slips, transfer documents, stock requisitions, batch specifications • manufacturer specifications, supplier or customer instructions • materials safety data sheets (MSDSs) • verbal or written communications • codes of practice, standards, regulations and legislation, including dangerous goods, airfreight, export, import, quarantine, bond or licence requirements • quality documentation, procedures.
Problems	Typical problems for your plant may include: • labelling problems (missing, damaged, illegible) • congestion and lack of appropriate storage area.

RANGE STATEMENT	
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS309B Operate particulates handling/storage equipment

Modification History

Release 2 – Minor changes to clarify unit and broaden its application, and minor editorial corrections.

Unit Descriptor

This competency covers the skills needed to manage a complex storage facility. This requires the operations technician to utilise the storage capacity efficiently, and to ensure particulates are stored in the appropriate containers/areas/stock pile. The operations technician also needs to monitor the quality and quantity of stock held in each.

Application of the Unit

The operations technician would operate the systems transporting particulates into or out of storage. This means setting up the required routing and starting and stopping conveyors/transport systems and their feeder systems (if any) to move materials from one point to another, for example, between storage units, from or into storage.

During the process the operations technician would monitor the transfer operations, and take appropriate action to keep particulates moving correctly. This could include removing blockages and preventing rat holing or bridging in hoppers/silos or other storage problems.

The operations technician would also maintain the cleanliness of the facility, along with carrying out minor maintenance according to procedures, and documenting/reporting maintenance requirements and other issues affecting the operation of the facility. At this level, the operations technician would also recognise and solve problems with the transfer or storage processes. This includes recognising indications of potential problems and taking appropriate and timely remedial action to ensure minimal loss of production time.

This competency also covers identifying and controlling hazards related to particulates handling equipment, storage facilities and surrounding areas.

For operations which do not require the managing of a complex storage facility see *PMAOPS210B Operate particulates handling equipment*.

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	Prepare for work	1.1 Identify work requirements
		1.2 Identify and control hazards
		1.3 Coordinate with appropriate personnel
2	Prepare storage facilities	2.1 Identify contents of each storage unit/area in the facility
		2.2 Recognise storage types for each product being stored
		2.3 Identify leakage and other problems with storage facility
		2.4 Confirm safety systems are operational (where required)
		2.5 Carry out general housekeeping of facility to remove foreign matter or hazards
		2.6 Record and/or communicate identified maintenance requirements
3	Operate conveyor /particulate transport systems	3.1 Identify the type of conveyor/feeder/transport system
		3.2 Identify the storage required to supply or store particulates
		3.3 Set up routing of transport systems to meet requirements
		3.4 Start up and shut down transport systems according to the

- type and duty
- 3.5 Complete routine checks, logs and paperwork, taking action on unexpected observations, readings and trends
- 3.6 Convey correct material from and to correct location as required
- 4 Operate ancillary equipment if appropriate
 - 4.1 Identify type of ancillary equipment
 - 4.2 Start up and shut down ancillary equipment according to its type and duty
 - 4.3 Monitor critical variables, such as amps, temperature or vibration, and recognise trends/patterns which indicate a potential or actual problem with the ancillary equipment
- 5 Manage particulates storage facility
 - 5.1 Monitor quality and quantity of stored solids
 - 5.2 Identify and deal with product contamination
 - 5.3 Transfer stock into, out of or between storage units as required
 - 5.4 Supply customers with correct quality and quantity in a timely manner
 - 5.5 Make effective use of available storage capacity
 - 5.6 Monitor storage facility for actual or potential problems likely to affect the efficient operation of the facility
- 6 Isolate and de-isolate plant/equipment
 - 6.1 Isolate plant/equipment
 - 6.2 Make safe for required work
 - 6.3 Check plant/equipment is ready to be returned to service
 - 6.4 Prepare plant/equipment for return to service

Required Skills and Knowledge

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

Required skills

For the particulates system:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving
- ability to distinguish between:
 - grade and specification of materials
 - types and causes of problems to a level that allows problems to be isolated to an item of equipment

Required knowledge

For the particulates system required knowledge includes:

- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit
- process parameters and limits (e.g. temperature, pressure, flow, pH and amps)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their resolution
- relevant alarms and actions
- plant/process idiosyncrasies
- all items on a schematic of the plant item and describe the function of each
- correct methods of starting, stopping, operating and controlling
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility

An understanding of the particulates handling system and its integral equipment, and also of the storage facility to a level needed to control the handling system and storage facility, and to recognise and resolve problems. In particular it includes the ability to:

- identify all items of the particulates handling system and describe the function of each
- identify the location of all storage units in the facility and their contents
- describe the causes and remedies of common problems such as those selected in the Range Statement

It also requires a knowledge of:

- particulate properties
- logistics
- forward demand
- material storage requirements
- compatibility and contamination issues

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.

Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an

appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Context of and specific resources for assessment

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Method of assessment

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- *MSAPMOHS100A Follow OHS procedures.*

Guidance information for assessment

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

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.

Codes of practice/standards

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 items of equipment, such as:

- mechanical conveyors/feeders (including belt, vibrating, screw and flight; and feeders such as screw, star, slide, volumetric and weight)
- pneumatic conveyors (including aspects such as dense

	phase, disperse phase, pressure and vacuum) • storage facilities (e.g. silos, hoppers, stock piles and including purging hoppers)
Problems	Typical problems include: • damage to particulates • contamination of stored stock • rat holing and bridging in silos • routing issues, and so on • storage vessel/area capacities
Start up shut down as required	Start up shut down as required includes: • start up and shut down to/from normal operating conditions • start up and shut down to/from isolated, cold, empty • all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance

criteria and HSE requirements, the HSE requirements take precedence.

Complex storage facility

A complex storage facility is one where, for example, there are:

- multiple storages which need to be managed
- significant logistics issues related to the transport and storage of the solids
- the solids transport systems allow for various routings of the solids
- possibilities of, or consequences from, contamination which are significant

Unit Sector(s)

Operational/technical

Competency field

Not applicable

Co-requisite units

Not applicable

PMAOPS312B Undertake ship loading/unloading operations

Modification History

Release 2 – Minor changes to clarify unit and broaden its application, and minor editorial corrections.

Unit Descriptor

In a typical scenario, the operations technician is responsible for the custody transfer of materials/products from the loading area to vessels or from vessels to storage areas. The operations technician will report the state of readiness of the loading facilities before starting transfer to the loading master and to the terminal operator.

Application of the Unit

Loading areas can include:

- terminal facilities
- jetties
- production platforms
- floating storage and offtake/floating production storage and offtake (FSO/FPSO).

The operations technician will control the cargo transfer rate within safe limits, which are agreed between the ship and/or the terminal prior to commencing transfer. Jetty and platform operators will observe the mooring and direct the positioning of ships in order to facilitate the safe connection and operation of loading arms and gantries. The operations technician will complete all necessary documentation for the control and calculation of product volumes.

Generally the operations technician would be part of a team during loading activities and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit applies to products such as liquefied natural gas (LNG), liquefied petroleum gas (LPG), oil, chemicals and particulates.

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	Prepare for work	1.1 Identify work requirements
		1.2 Identify and control hazards
		1.3 Coordinate with appropriate personnel
2	Prepare for ship transfer	2.1 Check that the vessel is ready for product transfer
		2.2 Activate/bring on line all safety systems
		2.3 Ensure all operational conditions for transfer of product are satisfied
		2.4 Ensure safety check documentation is completed
3	Transfer product to/from ship	3.1 Check transfer advice/documentation and complete required records
		3.2 Engage fire and deluge protection systems as required
		3.3 Launch and retrieve batching pigs as required
		3.4 Commence the transfer process of the specified product
		3.5 Control and monitor transfer rates and take appropriate action
		3.6 Monitor the progress of the transfer and levels and take appropriate action

- 3.7 Identify vapour or product leakages/spills and take appropriate action
 - 3.8 Apply emergency procedures as required
- 4 Complete transfer process
 - 4.1 Achieve or satisfy capacities and transfer requirements within the allowable timeframes and schedules
 - 4.2 Retrieve batching pigs as required
 - 4.3 Decommission, isolate and disengage transfer systems from or to the vessel as required
 - 4.4 Continue to monitor and control fire, deluge and safety systems during the finalization of the loading process and let-go of the vessel as required
 - 4.5 Complete all required logs and documentation and communicate the results of the transfer to the appropriate personnel
 - 4.6 Shut down and bring transfer facilities off line, ensuring that the area has been made safe after the transfer has been completed
- 5 Isolate and de-isolate plant
 - 5.1 Isolate plant
 - 5.2 Make safe for required work
 - 5.3 Check plant is ready to be returned to service
 - 5.4 Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the compressor system and distinguish between causes of problems/alarm/fault indications, such as:

- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problems
- metering problems
- spills/leaks
- meteorological events

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- all items on a schematic of the ship loading/unloading system and the function of each
- the nature/condition of materials being transferred to and from the vessel and the factors to be considered in the transfer operation
- effects of temperature and pressure in transfer operations
- storage and product transfer techniques and mediums
- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit and the materials/products being transferred
- process parameters and limits (e.g. temperature, pressure, flow, pH and amps)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling flow
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems
- types and causes of flow problems within operator's scope of skill level and responsibility

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.

Overview of assessment Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of

competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3-D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of ship loading and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Context of and specific resources for assessment

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of

questions which will be used to probe the reasoning behind the observable actions.

Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with relevant fluid flow and tank farming units.
Guidance information for assessment	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

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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all items of equipment and unit operations which form part of the ship loading/unloading system. For your plant this may include (select relevant items): • loading/unloading systems • loading arms • gantries • fire extinguishers, hoses and jets • gas and other hazard monitoring systems • mooring lines • compressors • storage tanks • pipelines, trunklines and conveyors • pig launcher, pig trap and batching pigs • measurement systems
Typical problems	Typical problems for your plant may include: • surging • control of temperature and pressure • variations in feed • product leakage

	• environmental hazards
Ship transfer	Ship transfer includes: the transfer of product or materials to or from ships (i.e. loading or unloading of ships)
Ready for transfer	Ready for transfer includes: • secured and properly moored • transfer points aligned
Safety systems	Safety systems include systems required to protect the vessel and personnel during product transfer, such as: • deluge • fire protection
Operational conditions for transfer	Operational conditions for transfer include: connect and initiate loading pumps/conveyors arms/hoses
Control of transfer rates	Transfer rates may be controlled to ensure: • the product is transferred safely • transfer is within the defined storage capacities
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government

regulations.

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Operational/technical

Competency field

Not applicable

Co-requisite units

Not applicable

PMAOPS319A Adjust batch

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the adjustment of a batch which has been manufactured to bring it into specification. It typically applies in batch plants where variability of materials leads to a variability in product which needs to be adjusted for.

Application of the Unit

Application of the unit	In a typical scenario a batch has been made in a batch kettle or vessel. The manufacturing process is not important to this unit and may involve a chemical reaction between materials or a dissolution or a mixing of materials or other process. After the batch has initially been made there will be some testing of the batch and then some adjustments will need to be made to bring it into specification. The adjustments may be to the chemical, physical or biological properties of the batch (or some combination of these). The adjustments will typically occur in the making kettle/vessel although this is not a necessary component of this unit. The operations technician would: • estimate what needs to be done • make the adjustment(s) • recheck and readjust as required • note anything which was out of the ordinary and take appropriate action The operations technician may make these adjustments in liaison with another person who does the required testing, or they may also do the testing themselves. Testing is not part of this unit - see relevant testing unit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel 1.4. Take sample(s) as required.
2. Estimate required adjustment.	2.1. Interpret test results 2.2. Identify any conflicting results or suspicious results and take appropriate action 2.3. Identify required adjustment protocol for this adjustment 2.4. Estimate amount and type of materials to be added or other adjustments required 2.5. Estimate duration of this adjustment.
3. Make adjustment.	3.1. Obtain required materials for adjustment 3.2. Determine addition rate for materials/rate of applying adjustment 3.3. Make adjustment at the determined rate 3.4. Monitor the batch as the adjustment occurs

ELEMENT	PERFORMANCE CRITERIA
	3.5. Take appropriate action.
4. Recheck batch	4.1. Repeat the adjustment process as required to bring batch to specification 4.2. Identify likely problems arising from adjustment process 4.3. Take appropriate action

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving
- analysis of test results

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- product specifications and tolerances
- systems operating parameters
- system integrity limits
- process specific physics, chemistry and mathematics
- distinguish between elements, compounds and mixtures in their raw materials and products
- describe the nature/condition of materials at each stage of the reaction (or making/adjusting process), the changes which have occurred in that stage and why they have occurred
- describe reaction (or making/adjusting process) in chemical terms, including the effect of changing variables such as temperature, pressure, catalyst, concentration, pH
- describe any reaction(s) using appropriate chemical equations
- state the type of vessel/reactor used and their characteristics (advantages and limitations)
- describe the methods of controlling the reaction/or adjustment, including rate and yield
- impact of external factors, eg variations in weather, feed etc
- effective communication techniques
- organisation 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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of the process control system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responses. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: estimates and protocols used are appropriate

EVIDENCE GUIDE	
	potential problems are recognised and appropriate action taken These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to a batch plant where adjustments are done over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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 italicized 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.	
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

RANGE STATEMENT	
Context	This unit of competency includes all such items of equipment and unit operations which form part of the product manufacture/adjustment system. This may include (select relevant items): • kettle or mixing vessel • heating and or cooling • material addition equipment • pumps, valves and pipes • mixers • fume/vapour extraction • reflux systems • emergency shutdown systems • communications systems.
Adjustment protocol	Adjustment protocols may include: • aiming to make a '90% (or other%) adjustment' first time • aiming to 'hit the target' first time • under/overshoot the target • other techniques of achieving optimal adjustment.
Adjustments required	Adjustments required may include: • adding more of some of the original materials • adding some additional materials • continuing to heat/stir or otherwise process the batch (with or without material addition)
Likely problems from adjustment process	Likely problems from adjustment process include: • product deterioration from extended processing • kettle/vessel overflows from repeated material additions • misleading test results causing inappropriate adjustments
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures

RANGE STATEMENT	
	• formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS320B Conduct artificial lift

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, an operations technician is responsible for controlling the artificial lift of fluids from operating wells either on land or off-shore using pumps, valves and compressors. The operations technician is also responsible for conducting tests and analyses of the product and the operating condition of the equipment.

Application of the Unit

Application of the unit	Fluids lifted by the process can include: • oil • condensate • gas • water. The operations technician would: • identify and rectify operational problems • monitor production • conduct tests • facilitate output changes. Generally the operations technician would be part of a team during startup and shutdown procedures and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Produce product.	2.1. Operate lifting process in accordance with local lease and lease equipment requirements and constraints 2.2. Operate pumps, valves and other production equipment to transfer product/fluid from well to surface 2.3. Test production equipment to ensure correct operating efficiencies are maintained 2.4. Monitor valves, pumps and other production equipment 2.5. Diagnose operational faults during the production phase 2.6. Take appropriate action.
3. Monitor product/volume efficiencies.	3.1. Select and operate the required equipment 3.2. Monitor fluid produced 3.3. Monitor and observe equipment 3.4. Take appropriate action.

ELEMENT	PERFORMANCE CRITERIA
4. Transfer product to storage.	4.1. Maintain records and reports 4.2. Communicate transfer of the product to all appropriate support groups and work groups downstream of the well 4.3. Select an appropriate medium for safe transfer of the product to the next phase in the product process 4.4. Observe and act upon all environmental conditions and legislative requirements to ensure the protection of the working environment is maintained during product transfer 4.5. Monitor transfer and take appropriate action.
5. Isolate and de-isolate plant.	5.1. Isolate plant 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the system and to be able to distinguish between causes of problems/ alarm/fault indications such as:

- lift gas variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- methods of down hole installation of equipment
- well bore hydraulics
- reservoir formation
- local knowledge concerning well operations
- principles of well operation
- pumping/compressor efficiencies, production volumes and product capacities.

REQUIRED SKILLS AND KNOWLEDGE

- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit and the fluids involved
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling flow
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training.

EVIDENCE GUIDE

	This unit of competency requires an application of the knowledge contained in the use of artificial lift systems and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	As a general rule assessment will require access to an operating artificial lift system over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

EVIDENCE GUIDE	
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with relevant fluid flow and sampling and testing units.
Guidance information for assessment	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	
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 italicized 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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit includes all such items of equipment and unit operations which form part of the wellhead system. For your plant this may include (select relevant items): • gas lifts • down hole pumps.
Typical problems	Typical problems for your plant may include: • gassing up • solids control • gas lift valve erosion • mechanical failures • electrical and instrument failures.
Monitoring of fluid produced	Monitoring of fluid produced may include: • testing and analysing product flow temperatures and pressures • determining fluid volumes • evaluating the production efficiencies of the well.

RANGE STATEMENT	
Monitoring equipment	Monitoring equipment may include: • operating condition • pressures and temperatures • operating parameters of the equipment.
Records and reports	Records and reports may be monitored to provide: • a history of the production capacities of the well • a record of any deviations which have occurred.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS321B Undertake well management

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario an operations technician operates, monitors and manages wells and ancillary equipment. The activity includes operating and monitoring the performance of well equipment, making adjustments to and reporting on product flows, identifying and reporting operational problems, being aware of and contributing to a safe working environment, and the safe and productive operation of the system.

Application of the Unit

Application of the unit	Well systems can include: • onshore and offshore production facilities • oil or gas production sites. Generally the operations technician would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Produce oil and gas.	1.1. Control and direct flows to meet demand requirements 1.2. Utilise process control instrumentation to produce oil/gas 1.3. Liaise with other services and contractors during the production phase 1.4. Collect, interpret, correlate and report or communicate selected data.
2. Conduct flow measurement.	2.1. Apply appropriate mathematical formulae and formats to determine product volumes 2.2. Collect and utilise appropriate production data to determine product flows 2.3. Analyse historical data and records to monitor and determine well performance 2.4. Calculate production figures and targets, and apply this data to all functions related to this competency 2.5. Take appropriate action.
3. Monitor well and associated production equipment.	3.1. Monitor operational condition and efficiencies of equipment 3.2. Implement corrosion control procedures for all equipment to maintain its operating integrity 3.3. Conduct inspections of instrumentation equipment 3.4. Take appropriate action

ELEMENT	PERFORMANCE CRITERIA
	3.5. Liaise with maintenance operations to determine and prioritise any required maintenance.
4. Transfer product.	4.1. Separate products into their respective product groupings 4.2. Treat all excess separation process waste water, utilising the appropriate chemical and disposal techniques 4.3. Transfer product to appropriate location for future processing or sale 4.4. Maintain all well logs and records as required 4.5. Monitor transfer and take appropriate action.
5. Isolate and de-isolate plant.	5.1. Isolate plant 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure malfunction
- electrical failure malfunction
- mechanical failure malfunction
- equipment design deficiencies
- change in product parameters (temperature, flows, pressure and levels)
- fouling or contamination
- corrosion
- quality measurement inaccuracy, eg from analyser or manual sampling deficiencies.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- well design and construction
- fluid dynamics and statics

REQUIRED SKILLS AND KNOWLEDGE

- natural gas and oil characteristics
- reservoir management and characteristics
- static electricity principles
- flange, pressure and temperature ratings
- corrosion control and chemical handling
- environmental aspects and conditions
- hydrate formation.
- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit and the fluids involved
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling plant
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of

EVIDENCE GUIDE	
	parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in well operation and the equipment integral to its use, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and

EVIDENCE GUIDE	
	similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating well over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with <i>PMAOPS320B Conduct artificial lift.</i>
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. For your plant this may include (select relevant items): - valves including non-return valves - pumps - prime movers - product separation units - instrumentation

RANGE STATEMENT	
	• testing equipment • hydraulic power units.
Typical problems	Typical problems for your plant may include: • leakage • vibration • loss of control of pressure and/or flow • hydrates/blockages • liquid slugging • corrosion • scale formation • erosion.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS323A Operate and monitor heating furnace

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers performing start-up, take-over/hand-over, monitoring, shut-down and storage of a heating furnace and associated equipment to legislative requirements, standards and codes of practice.

Application of the Unit

Application of the unit	This unit applies to the start-up, take-over/hand-over and shut-down of a fired heating furnace. Furnaces covered by this unit would typically have the following features: • modulating combustion air supply • modulating single heat source • modulating firing rate, economisers and other associate equipment. The unit applies to furnaces used for heating heat transfer fluids which may include natural and synthetic oils or other media and other industrial uses as required in the workplace. The furnace may be singular or in a battery of furnaces. Work includes inspection procedures as specified in the manufacturer recommendations and workplace procedures, identification of maintenance requirements and hazard control measures. All work is carried out to applicable State/Territory and National OHS legislation, standards and codes of practice. Generally the technician would work alone or as part of a team for this unit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Start up furnace.	2.1. Perform pre-start-up checks 2.2. Start up individual items of equipment and the entire furnace system 2.3. Start up from standby and after maintenance 2.4. Increase temperature steadily with no surges or lulls 2.5. Stabilise furnace to produce required heat within required time.
3. Monitor and control the heating furnace.	3.1. Complete routine checks, logs and paperwork 3.2. Recognise the signs of potential and actual problems 3.3. Take appropriate action to minimise the impact of potential and actual problems 3.4. Monitor condition of heat transfer components (if any) and take appropriate action 3.5. Monitor fuel/air supplies and ratios and take

ELEMENT	PERFORMANCE CRITERIA
	appropriate action 3.6. Trim furnace as required.
4. Change heating rates.	4.1. Predict from rates and schedule when a transition will be required 4.2. Give advanced notice of transition to work team 4.3. Trim plant in a manner which prepares it for the change 4.4. Manage changes smoothly and in a timely manner
5. Maintain furnace effectiveness.	5.1. Frequently and critically monitor all plant throughout shift 5.2. Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant 5.3. Identify critical equipment/processes and tune their performance 5.4. Identify issues likely to impact on performance and take appropriate action 5.5. Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people
6. Shut down furnace.	6.1. Determine type of shut down required 6.2. Give advance warning of shut down where possible 6.3. Change over individual items of equipment 6.4. Shut down individual items of equipment and the entire furnace system 6.5. Shut down to a stand-by condition if required 6.6. Shut down in an emergency when required
7. Isolate and de-isolate furnace system and individual items.	7.1. Isolate plant 7.2. Make safe for required work 7.3. Check plant is ready to be returned to service 7.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Look for evidence that confirms skills in:

- following, standard operating procedures and statutory requirements
- performing preoperational checks of furnace
- performing maintenance checks
- orally reporting routine information
- identifying hazards, hazardous situations and control measures
- using personal protective clothing and equipment
- selecting the most appropriate prevention/control measure for a given situation
- starting up furnaces, including those fitted with associated equipment such as economisers
- monitoring furnaces, including checks of combustion management system and economiser operation
- checking operating status
- recording routine and familiar information in operating log and other standard workplace forms
- using testing equipment
- responding to typical emergency situations
- notifying downstream users
- performing operational and inspection shut-down, including procedures for associated equipment, such as economisers
- isolating furnace from any common connection between the furnace and other furnaces on line and all access points required for inspection

Required knowledge

Look for evidence that confirms knowledge of:

- pre-operational checks
- procedures for identifying and reporting maintenance requirements
- statutory requirements and workplace procedures for identifying and reporting hazards in the work area
- use and application of personal protective equipment
- safe work practices and procedures
- prevention and control measures
- the processes for starting a furnace, such as heat input, warm up of the reticulation system, systems operation, reticulation line pressure, heating fluid usage and supply, associated equipment such as economisers
- the process for confirming operational status of furnace
- procedures for maintaining an operating log and communicating furnace status
- procedures for communicating furnace status and operation
- principles of furnace operation - single and battery
- furnace fittings
- preparing furnace for inspection

REQUIRED SKILLS AND KNOWLEDGE

- heating fluid feed systems
- procedures for monitoring a furnace, such as heating fluid reticulation line pressure/temperature, usage, supply and quality of heating fluid, combustion/heat source system, fuel system, combustion air supply, operation of control/safety devices, combustion management system, associated equipment such as economisers
- function, purpose and location of associated equipment, such as economiser, air heater, feed heater, economiser relief valves, main stop valve
- procedures such as identification of emergency isolation of heat source, operation of furnace, selection and application of fire fighting equipment and notification of downstream users
- operational shut-down processes and procedures, such as cooling down, furnace pressure/vacuum and fuel/heat source isolation
- shut down processes and procedures for internal inspection, such as confirming furnace cooling down, vacuum/pressure, fuel/heat source isolation, removal of combustion equipment and water from furnace
- isolation procedures and safety issues
- procedures for cleaning furnace internally and externally
- various modes of furnace storage, which may include integral associated equipment such as economisers
- the reasons for selecting particular storage mode
- procedures for storing a furnace in shut-down mode

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include a range of problems, problem causes and environments.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual problems and should include the use of

EVIDENCE GUIDE	
	case studies/ scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to define and analyse the problem as well as deal with the stakeholders. The stakeholders should be satisfied with the solution, as well as the solution being technically sound. Consistent performance should be demonstrated. In particular look to see that: • different types of problems can be analysed and resolved • different types of stakeholders can be satisfied • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken. These aspects may be best assessed using a range of scenarios/case studies/what-ifs. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past history and similar sources.
Context of and specific resources for assessment	Assessment will require a suitable method of gathering evidence of problem solving ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Furnace shut down	Furnace shutdown may be for: - operational shut down - inspection shut down - maintenance/cleaning shut down - other
Pre-operational checks	Heat exchange fluid feed supply, fuel supply/heat source, furnace valves - their operation and position, combustion air supply and combustion equipment
Furnace	Modulating combustion air supply, modulating single heat source, modulating firing rate, economisers, single and battery
Appropriate action	Appropriate action includes: - determining problems needing action - determining possible fault causes - rectifying problem using appropriate solution within area of responsibility - following through items initiated until final resolution has occurred - reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: - all work instructions - standard operating procedures - formulas/recipes - batch sheets - temporary instructions - any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice

RANGE STATEMENT	
	(eg Responsible Care) and government regulations.
Hazards	Chemical and thermal hazards, manual handling, machine guarding, illumination of work area, rubbish and combustible materials, heat transfer fluid and fuel leaks etc.
Associated equipment	Economiser, economiser relief valves, air heater, feed heater, main heating fluid stop valve, feed pumps, fans
Monitored	Heating fluid pressure and temperature, flame and combustion conditions, heating fluid feed and return systems, fuel system, combustion management system, heating fluid management system, heating fluid manifold fittings, soot blowers
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMAOPS324A Operate a gas turbine

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the operation of a stationary gas turbine in a typical power generation or compression operation.

Application of the Unit

Application of the unit	In a typical scenario a gas turbine and its ancillary equipment is used to drive a power generation unit, high pressure pump or compressor. It is a complex, independent item of equipment with a specialised start-up and shutdown procedure. It may have its own control panel and inbuilt vibration monitoring equipment. The operation of a gas turbine may require a 'ticket' (special licence) to operate. Check local requirements. This unit includes starting up/shutting down and monitoring the performance of the equipment and a full understanding of OHS requirements, including emergency situations. The operations technician would: • identify and report operational problems • be aware of and contribute to a safe working environment • contribute to the safe and productive operation of the turbine • monitor, shut down and start up turbine and ancillary equipment using relevant procedures. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare equipment for operation.	1.1. Check that the turbine is not subject to maintenance or that other permitted activities are not taking place near the equipment 1.2. Check the control panel to ensure that all indications support the safe starting of the turbine 1.3. Conduct required safety checks and pre-starts to determine or verify the operational condition of the equipment.
2. Start the gas turbine.	2.1. Commission turbine protection devices prior to the start-up of equipment 2.2. Achieve operational flows and temperatures of ancillary equipment before bringing the system on line for use 2.3. Start the gas turbine according to procedures.
3. Monitor and assess gas turbine systems.	3.1. Check operation and function of the gas turbine by applying principles of operation and procedures 3.2. Monitor and correct fuel and energy systems and flows to ensure that the system provides the proper operational mixture for turbine use 3.3. Ensure adequate supplies of clean air at the stated rate or

ELEMENT	PERFORMANCE CRITERIA
	temperature are delivered to the turbine to allow for successful operation to be achieved 3.4. Check exhaust gas and turbine operating temperatures to ensure correct temperature gradients in the turbine 3.5. Monitor lubrication systems to verify that operational parts are functioning efficiently and effectively, and to ensure that all moving parts are operating in a friction free and clean environment 3.6. Monitor and adjust cooling systems to allow for the most efficient operating temperature to be maintained throughout all operating conditions 3.7. Monitor governing systems to allow correct operational speeds of equipment to be maintained and regulated.
4. Conduct operational maintenance.	4.1. Conduct routine inspections and checks to ensure normal or stated turbine operation is maintained 4.2. Identify equipment faults through observation of the operational equipment and periodic sampling and testing 4.3. Determine action and communicate maintenance requirements to appropriate personnel 4.4. Record operational data to provide a historical record of the operating condition of equipment.
5. Prepare equipment for maintenance.	5.1. Shut down gas turbine in line with procedures 5.2. Isolate turbine for maintenance in accordance with procedures
6. Control hazards.	6.1. Identify hazards in the work area 6.2. Assess the risks arising from those hazards 6.3. Implement measures to control those risks in line with procedures and duty of care.
7. Respond to gas turbine problems.	7.1. Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 7.2. Recognise turbine operational problems 7.3. Analyse cause of operational problems within scope of skill level 7.4. Take timely and appropriate action to solve operational problems.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to distinguish between causes of problems/alarms/fault indications such as:

- turbine failure or malfunction
- electrical failure or malfunction
- mechanical failure/malfunction
- quality measurement inaccuracy, eg analyzer, manual sampling deficiencies
- air/fuel quality

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- identify all items on a schematic of the turbine and describe the function of each
- turbine operating parameters and capacities
- turbine operating principles, including fuel injection, lubrication, cooling, ignition, induction and exhaust power supply
- equipment operation, including, pressures temperatures and speeds
- turbine equipment terminology
- process drawings, eg PID, PFS. cause and effect
- safety systems 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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

EVIDENCE GUIDE

	Simulation may be required to allow for timely assessment of parts of this unit of competency (eg Elements 1, 2 and 4). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of the turbine and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the turbine, incidents on similar turbines around the world, hazard analysis activities

EVIDENCE GUIDE	
	and similar sources.
Context of and specific resources for assessment	As a general rule assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the operating system. For your plant this may include (select relevant items): • gas turbine engines • electric motors • governing systems • power supply • safety and shutdown systems • cooling systems.

RANGE STATEMENT	
	Typical problems for your plant may include: • variation in power/fuel supply • vibration • overheating • fouling of turbine/engine/exchangers • lubrication quality • ancillary equipment failures.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS325B Generate electrical power

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario an operations technician operates, monitors, starts up and shuts down power generation systems and ancillary equipment.

Application of the Unit

Application of the unit	This unit includes operating and monitoring the performance of the power generation plant and making appropriate changes to meet power demand. This includes a full understanding of the process and all OHS requirements including emergency situations. The operations technician would: • identify, correct and report operational problems • be aware of and contribute to a safe working environment • contribute to the safe and productive operation of the system • operate, monitor and maintain equipment using relevant procedures. Generally the operations technician would be part of a team during start-up, shutdown and normal operating conditions. However they would be expected to be capable of demonstrating competence in all parts of this unit. They would be taking a leading role in liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare for power generation.	2.1. Communicate startup of power generation to all required personnel 2.2. Select the prime mover to be used 2.3. Select system for the generation process appropriate to voltage systems and requirements 2.4. Conduct pre-start-up checks as required 2.5. Start the prime mover for the generation system to procedures 2.6. Synchronise all equipment to transfer the power safely into the system.
3. Operate generation equipment.	3.1. Balance loads and power factors 3.2. Monitor and adjust loads as required to ensure that all machine loads are maintained within safe working conditions 3.3. Distribute energy to the generation system in a safe and efficient manner, ensuring that the status of all equipment is monitored as required 3.4. Rebalance loads as required so as to maximise production efficiency

ELEMENT	PERFORMANCE CRITERIA
	3.5. Take other appropriate action as required 3.6. Maintain logs to record all systems data and identify all deviations or problems encountered
4. Shut down process.	4.1. Communicate shutdown of process to all required personnel 4.2. Systematically shed loads, shut down generators as required during the shutdown process 4.3. Isolate all required equipment from the bus in accordance with procedures 4.4. Return the system to a balanced operating condition after shutting down selected generator(s).
5. Isolate and de-isolate plant.	5.1. Isolate plant 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the system and to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure malfunction
- electrical failure malfunction
- mechanical failure malfunction
- equipment design deficiencies
- changes in fuel quality.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- cathodic protection techniques
- switching techniques
- isolation procedures
- earthing techniques
- voltage systems

REQUIRED SKILLS AND KNOWLEDGE

- electrical generation and distribution theory
- theory of synchronisation
- hazards associated with chemical substances such as PCBs.
- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit
- process parameters and limits, eg temperature, pressure, flow
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the

EVIDENCE GUIDE	
	case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of the electrical generation system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case

EVIDENCE GUIDE	
	studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: • <i>PMAOPS221B Operate and monitor prime movers.</i>
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. For your power generation system this may include (select relevant items): • high voltage and low voltage AC and DC • battery systems • uninterrupted power supplies (UPS) • switchboards • prime movers • transformers • unit control panels • electrical protection equipment.
Typical problems	Typical problems for your plant may include: • variation/loss of fuel/energy supply

RANGE STATEMENT	
	• control equipment failure • power demand changes • change in atmospheric conditions (rain, temperature, wind, lightning) • emergency situations.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS326B Produce product using gas absorption

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario an operations technician operates and monitors gas absorption units and ancillary equipment such as glycol dehydration or CO ₂ absorption units.

Application of the Unit

Application of the unit	In this role the operations technician would: • identify and report operational problems • be aware of and contribute to a safe working environment • contribute to the safe and productive operation of the system • operate, monitor and maintain equipment using relevant procedures. Generally the operations technician would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does <u>not</u> require the operation of a central control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Start up absorption system	2.1. Check the operational condition of all required process equipment to ensure that it is ready for startup 2.2. Bring absorption systems on line, ensuring all equipment is correctly lined up to procedures 2.3. Monitor absorption process ensuring the plant is operating safely and efficiently 2.4. Take appropriate action.
3. Undertake gas absorption.	3.1. Operate the process equipment 3.2. Select the appropriate medium for the stripping and rectification of the product 3.3. Recover all products from the medium by skimming as necessary 3.4. Monitor vapour pressures to ensure that product remains on specification 3.5. Top up and drain medium used in the process as required to maintain operating levels 3.6. Maintain liaison with required personnel.
4. Monitor the process.	4.1. Monitor product and process variables 4.2. Take appropriate action

ELEMENT	PERFORMANCE CRITERIA
	4.3. Record any product variations and note the type of variation 4.4. Record actions as required
5. Isolate and de-isolate plant.	5.1. Isolate plant 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the compressor system and to distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies
- product parameters (temperature, flows, pressure and levels)
- fouling or contamination
- corrosion
- quality measurement inaccuracy

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- principles of operation of the absorber
- product tolerances and specifications
- system's operating parameters
- process control philosophies and strategies
- outside process/production operational knowledge, including column operation, furnaces and trays
- extraction principles
- hydrate formation.
- physics and chemistry relevant to the process unit and the fluids/materials
- process parameters and limits, eg temperature, pressure, flow, pH

REQUIRED SKILLS AND KNOWLEDGE

- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling plant
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of gas absorption equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios

EVIDENCE GUIDE	
	both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with relevant fluid flow units.
Guidance information for	Assessment processes and techniques must be

EVIDENCE GUIDE	
assessment	culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

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 italicized 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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. For your plant this may include (select relevant items): • heat exchangers, coolers and cooling systems • turbines, including LSO, relay oil and governing • pumps and filters • valves • regeneration or top-up systems • columns, towers • vessels.
Typical problems	Typical problems for your plant may include: • variation/loss of feed • unstable control of pressure, temperature level and flows • control equipment failure • process plant trips • change in atmospheric conditions (rain, temperature, wind, lightning) • medium contamination (acidic - pH, solids, water content, hydrocarbon content) • poor regeneration (flow/heat/cooling) • analyser inaccuracy/malfunction.
Operation of process	Operation of process equipment includes:

RANGE STATEMENT	
equipment	- ensuring that all required valves, systems and equipment are lined up - ensuring steady operating conditions
Appropriate action	Appropriate action includes: - determining problems needing action - determining possible fault causes - rectifying problem using appropriate solution within area of responsibility - following through items initiated until final resolution has occurred - reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: - all work instructions - standard operating procedures - formulas/recipes - batch sheets - temporary instructions - any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS327B Produce product using fixed bed dehydration

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario an operations technician operates and monitors fixed bed dehydration units and ancillary equipment.

Application of the Unit

Application of the unit	This unit includes the operations technician identifying and reporting operational problems, being aware of and contributing to a safe working environment, contributing to the safe and productive operation of the system, and operating, monitoring and maintaining the equipment using relevant procedures. Generally the operations technician would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not apply to glycol dehydration systems - see <i>PMAOPS326B Produce product using gas absorption</i>

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Start up dehydration system.	2.1. Check all required equipment is ready for startup 2.2. Start up dehydration systems and bring on line, ensuring all equipment is correctly lined up to procedures 2.3. Monitor dehydration process, ensuring the plant is operating safely and efficiently.
3. Undertake dehydration of product.	3.1. Apply knowledge of hydride formation, absorption and/or adsorption process theories to facilitate safe operation of the process 3.2. Adjust operating parameters and process conditions during dehydration in order to keep product moisture within specification 3.3. Ensure that heating and cooling times during the dehydration and regeneration process are such that the product remains on specification 3.4. Maintain liaison with required personnel throughout the process 3.5. Re-sequence process equipment as required to achieve and maintain required operating criteria 3.6. Monitor operation and take appropriate action.
4. Record process	4.1. Record any product variations, noting the type of

ELEMENT	PERFORMANCE CRITERIA
variations and communicate problems.	variation and action taken to rectify the variation 4.2. Record actions as a reference and for any further investigation 4.3. Arrange maintenance of operational equipment as required and communicate to appropriate personnel 4.4. Isolate identified operational equipment requiring maintenance from the process and purge in accordance with procedures to rectify the problem.
5. Isolate and de-isolate plant.	5.1. Isolate plant 5.2. Make safe for required work 5.3. Check plant is ready to be returned to service 5.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the dehydration system and to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies
- product parameters (temperature, flows, pressure and levels)
- fouling or contamination
- corrosion
- quality measurement inaccuracy, eg from analyser or manual sampling deficiencies

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- principles of operation of dehydrator
- product tolerances and specifications
- process control philosophies and strategies
- outside process/production operational knowledge, including columns, furnaces, waste

REQUIRED SKILLS AND KNOWLEDGE

- heat recovery and trays
- extraction principles
- other process equipment, including valves
- hydrate formation
- adsorption/desorption
- alarm systems.
- physics and chemistry relevant to the process unit and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may

EVIDENCE GUIDE	
	also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of dehydration and integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range

EVIDENCE GUIDE	
	of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: • <i>PMAOPS223B Operate and monitor valve systems.</i> • <i>PMAOPS304B Operate and monitor compressor systems and equipment.</i>
Guidance information for assessment	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	
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.	
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. For your plant this may include (select relevant items): • vessels • valves • compressors • piping systems • exchangers • furnaces • columns and towers • cooling and heating systems

RANGE STATEMENT	
	• burner management systems • programmable logic controllers (PLCs) • filters • analysers.
Typical problems	Typical problems for your plant may include: • variation/loss of feed • unstable control of pressure, temperature level and flows • control equipment failure • process plant trips • change in atmospheric conditions (rain, temperature, wind, lightning) • emergency situations • desiccant contamination • desiccant damage/bed collapse (overpressuring) • poor regeneration (flow/heat/cooling).
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS329B Produce product using liquid extraction

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	A typical example of liquid extraction occurs in a natural gas processing plant and contains an absorber, de-ethaniser tower, turbo expander compressor, cold separator vessel and various plate fin type heat exchangers. An operations technician would be monitoring and controlling this process in order to achieve condensation of all the desired product to meet a predetermined specification.

Application of the Unit

Application of the unit	The turbo expander and absorber tower can be considered to be the heart and lungs of the unit. Cryogenic absorbers may be trayed or packed and will be designed to provide sufficient vapour liquid contact to achieve the required overheads and bottoms product specification. The operations technician will be able to: • identify and correct operational problems • determine the impact of composition changes • liaise with maintenance to schedule equipment availability. This competency would be undertaken within a team environment and in conjunction with the overall control of the product being produced.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Bring system on line.	2.1. Bring process equipment into operational condition, ensuring that all trays, columns and heat exchangers are operating within their specified parameters 2.2. Make ready liquid extraction systems and related equipment and bring on line during start-up 2.3. Apply a knowledge of turbo expander and Joule Thomson theories and principles to the safe operation of the system.
3. Monitor liquid extraction process.	3.1. Identify cryogenic products and any other hazards to determine what safety requirements may be necessary 3.2. Transfer product to the next stage of the production process. 3.3. Monitor the product variables, ensuring they stay within specification 3.4. Check process equipment, including pumps, compressors and heat exchangers, and keep within operating parameters 3.5. Record product and equipment deviations. 3.6. Take appropriate action
4. Isolate and de-isolate plant.	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service

ELEMENT	PERFORMANCE CRITERIA
	4.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence also includes the ability to isolate the causes of problems to an item of equipment within the liquid extraction system and to distinguish between causes of problems/alarms/fault indications such as:

- process gas variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- principles of operation of liquid extractors
- product tolerances, limitations and specifications
- systems operating parameters
- process control philosophies and strategies
- stabilisation principles
- the basis of cryogenic operations.
- physics and chemistry relevant to the process unit and the fluids involved
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling plant
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the liquid extraction and integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised

EVIDENCE GUIDE	
	- the range of possible causes can be identified and analysed and the most likely cause determined - appropriate action is taken to ensure a timely return to full performance - obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with relevant fluid flow units.
Guidance information for assessment	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
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 if the

RANGE STATEMENT	
candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the liquid extraction system. For your plant this may include (select relevant items): • absorber tower • expanders/compressors • lube oil system • instrumentation • cold separator • pumps • fans • refrigeration systems or cryogenic systems.
Typical problems	Typical problems for your plant may include: • design temperature constraints • CO2 freezing • flooding.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.

RANGE STATEMENT**Health, safety and environment (HSE)**

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS330B Communicate and monitor pipeline activities

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In this scenario operations technicians maintain a watching brief over the pipeline from the pipeline control centre. The centre will be the hub for pipeline activities in order to achieve minimum risk to continued safe and efficient operation of the pipeline system. The pipeline control centre operations technician will communicate with field personnel to obtain information and direct field operators to check and maintain pipeline operations.

Application of the Unit

Application of the unit	The operations technician will: • ensure the safety of the system and check operational equipment prior to start up • maintain productivity through the monitoring of flows, pressures and temperatures in the field • maintain communication with product suppliers and user customers to maintain the safe and efficient operation of the pipeline. Generally the pipeline control centre operations technician would be part of a team during pipeline startup and shutdown procedures. However, they will be expected to be capable of performing all parts of this unit on their own. At all times they would be liaising and cooperating with other members of the team and customers. AS 2885 Part 3 forms the principle reference standard for this competency.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Gather information about pipeline operation needs.	1.1. Respond to and record messages and information received from field operations and pipeline system stations 1.2. Interpret and acknowledge alarm codes correctly to ensure the correct response strategy is selected and applied to the situation 1.3. Clarify additional information needs and select an appropriate communication medium to deliver the information required 1.4. Improve operational efficiency through adequate and timely application of information provided 1.5. Interpret and action customer/shipper gas forecasts to ensure correct gas flow rates into the pipeline system are achieved.
2. Communicate pipeline information.	2.1. Monitor activities of pipeline personnel in the field and data from the control centre 2.2. Evaluate internal messages and response communications concerning system alarms/incidents to establish the scope and severity of the alarm/ incident 2.3. Convey pipeline system operation information to relevant personnel in other work areas to ensure safe and efficient operation of the pipeline system 2.4. Relay information to technicians and other services/parties

ELEMENT	PERFORMANCE CRITERIA
	so that fault finding or safety checks can be conducted to identify risks to product supply, pipeline equipment, environment and personnel 2.5. Authorise, record and monitor permits to work to allow operational activities to be undertaken or cancelled.
3. Coordinate pipeline systems operations.	3.1. Monitor field and pipeline station operations data 3.2. Monitor and observe equipment operating conditions, pressures and temperatures, and maintain correct equipment operating parameters 3.3. Identify faults and initiate the required repair or reporting of the fault 3.4. Isolate identified faults in the pipeline as appropriate 3.5. Respond to system alarms and emergencies 3.6. Determine the required course of action or emergency response to the identified system condition/ emergency 3.7. Complete and document pre-shutdown checks 3.8. Shut down the pipeline system under either normal or emergency conditions in accordance with operating procedures 3.9. Confirm all identified maintenance is in compliance with the permit to work system and administer to ensure that all work complies with all issued permits.
4. Record and report.	4.1. Record and monitor field personnel movements to ensure the safety of all personnel in the field 4.2. Report safety and environmental risks or faulty equipment to designated personnel for further action or advice concerning the selection of the appropriate response or course of action 4.3. Interpret and maintain field inspection records and reports 4.4. Complete operations and production reports 4.5. Perform shift handover procedures.
5. Control hazards.	5.1. Identify hazards in work area 5.2. Assess the risks arising from those hazards 5.3. Implement measures to control those risks in line with procedures and duty of care.
6. Resolve problems.	6.1. Identify possible problems in equipment or process 6.2. Determine problems needing action 6.3. Determine possible fault causes 6.4. Rectify problem using appropriate solution within area of responsibility

ELEMENT	PERFORMANCE CRITERIA
	6.5. Follow items initiated up until final resolution has occurred 6.6. Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the compressor system and distinguish between causes of problems/alarm/fault indications such as:

- pipeline pressure variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problems.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- pipeline system functions within the design parameters and design philosophy
- process information schemata of the pipeline system and associated facilities
- pipeline operating principles, parameters and product specifications
- relevant workplace documentation
- SCADA systems
- alarm systems and emergency systems, including fire and shutdown
- the 'permit to work' system
- architecture of the pipeline system
- pipeline system operating parameters
- gas quality/analysis equipment operation
- MSDS information.
- physics and chemistry relevant to the process unit and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities

REQUIRED SKILLS AND KNOWLEDGE

- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant/ pipeline and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the systems in the pipeline control centre and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

Critical aspects for assessment and evidence required to demonstrate

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from

EVIDENCE GUIDE	
competency in this unit	a disaster. Consistent performance should be demonstrated. In particular look to see that: - early warning signs of equipment/processes needing attention or with potential problems are recognised - the range of possible causes can be identified and analysed and the most likely cause determined - appropriate action is taken to ensure a timely return to full performance - obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: <i>MSAPMPER202A Observe permit work</i> <i>PMAOPS230B Monitor, operate and maintain pipeline stations and equipment.</i>
Guidance information for assessment	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
The Range Statement relates to the unit of competency as a whole. It allows for different work

RANGE STATEMENT	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the pipeline control system. For your organisation this may include (select relevant items): • radio communications equipment, email, fax and telephones • heaters, furnaces and exchangers • station instrumentation/metering equipment • condition monitoring equipment • process control equipment • gas quality and analysis equipment • valves, actuators and flanges • piping systems • pressure vessels/filtration equipment • compressors and prime movers • cathodic protection systems.
Typical problems	Typical problems for your plant may include: • communications disruptions • corrosion/hydrate formation • variations in flow temperature and/or pressure • failures of piping, valves or flanges • pipeline leakages.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures

RANGE STATEMENT

	• formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Occupational Health and Safety (OHS)	The identification and control of hazards and the application of OHS is to be in accordance with current, applicable legislation and regulations and company procedures. All work is carried out at all times in accordance with these requirements

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS333A Operate wells and gathering systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency would be expected to be achieved by a field operator. It covers the skills required to monitor and operate wells and associated equipment in the field and to recognise, report and resolve problems and make adjustments.

Application of the Unit

Application of the unit	This unit of competency applies to field operators who are responsible for a number of wells and their associated systems. In a typical scenario, the operator will be driving alone, on and off roads between wells and also to and from the base site or plant. While at a site, they will be operating and monitoring well and equipment performance by taking readings, making checks of and adjustments to plant and equipment. They will record and report their findings in accordance with procedures. They will also be expected to identify hazards and actual and potential process and plant problems and take appropriate action. This competency is typically performed by operators working independently while in communication with a senior operator or plant operator with whom they would work as part of a team. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel 1.4. Determine appropriate route/schedule for day's work
2. Monitor site, plant and equipment	2.1. Complete site checks 2.2. Use well control systems 2.3. Take required readings 2.4. Complete required lease maintenance
3. Operate well/system	3.1. Take appropriate action based on checks/readings made 3.2. Read and interpret well fluid levels

ELEMENT	PERFORMANCE CRITERIA
	3.3.Adjust pump speed as required 3.4.Check meter readings validity as required 3.5.Complete required process related calculations 3.6.Recognise equipment/system faults and report as required 3.7.Adjust well/system as required by operational or other requirements 3.8.Complete logs and reports as required
4. Start up well/system	4.1.Perform pre-start up checks 4.2.Correctly sequence all required equipment/plant/systems 4.3.Bring equipment/plant/systems into operation as required 4.4.Monitor critical variables during start-up and make adjustments as required 4.5.Bring to required steady operating conditions smoothly and in an appropriate time
5. Shut down well/system	5.1.Determine type of shutdown required 5.2.Give advanced warning of shutdown where possible 5.3.Shut down individual items and/or the entire well/system 5.4.Shut down to standby condition if required 5.5.Shut down in an emergency if required 5.6.Reset trips and alarms after shutdown 5.7.Leave plant in the required condition after shutdown
6. Isolate and de-isolate an item of, or an entire system	6.1.Isolate system in accordance with procedures 6.2.Make system safe as required 6.3.Check system is ready to be returned to service 6.4.Prepare system for return to service
7. Finalise shift activities	7.1.Complete shift tasks as appropriate 7.2.Ensure identified faults are correctly logged/reported for action 7.3.Ensure incomplete tasks are scheduled for follow up 7.4.Ensure all logs and reporting are complete and understood

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- mathematics to the level of calculating volumetric flow rates and other process/equipment conditions (e.g. efficiency)

Required knowledge

Required knowledge includes:

- coal seam gas (CSG) formation, structure and completions
- coal type and structure
- well design and construction
- hydrate formation
- free flow and pumped wells
- pumping principles
- gas flow principles
- gas/water separation principles
- draining and venting requirements
- typical issues causing problems and the resolution of those problems
- lease requirements
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- static electricity and earthing
- corrosion control and chemical handling and material safety data sheets (MSDS)
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, problem solving of each

REQUIRED SKILLS AND KNOWLEDGE

- physics and chemistry relevant to each unit and the processes used
- flange pressure and temperature ratings (basic)
- cathodic protection (basic)
- relevant environmental and heritage requirements
- protective systems
- control systems
- remote terminal unit, functions, operation and problems
- downhole drawings (DHDs) and their application to plant/well operation
- mathematical formulae and their application to well flow rates and plant operation/efficiency
- pump, drivehead, fuel gas systems operations and principles
- fluid dynamics and statics as relevant to the system
- natural gas and oil characteristics
- reservoir management
- environmental aspects and conditions

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

This unit of competency requires an application of the knowledge contained in the use of the equipment, to the level needed to maintain control and recognise and resolve problems.

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

Assessment for this unit of competency will be on a plant.

It is essential that the equipment be understood and that the importance of critical material properties, settings and readings is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment processes needing attention or with potential problems are recognised

EVIDENCE GUIDE	
	- the range of possible causes can be identified, analysed and the most likely cause determined - appropriate action is taken to ensure a timely return to full performance - obvious problems in related plant/system areas are recognised and an appropriate contribution made to their solution. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.
Context of and specific resources for assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training. A bank of scenarios/case studies/what-ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.
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

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

Procedures may be written, verbal, computer-based or in some other form. They include:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations

All work will comply with procedures

Site

Site may be:

- a well
- a nominated area in the gathering system
- another location where the operator is required to work

Equipment

Typical items of plant and equipment included in this unit of competency are:

- wellheads
- chokes and control valves
- meters
- flow lines
- high point vents
- low point drains

RANGE STATEMENT	
	• valves including non-return and pressure/vacuum relief • pumps and their prime movers • product separation units • instrumentation and control systems (variable speed drive (VSD) and proportional integral derivative (PID)) • testing equipment • power units • drive heads • flares
Equipment condition and operation checks and adjustments	Equipment condition and operation checks and adjustments may include: • chemical injection equipment • field flares • storage tanks • pumps and pump speed • autodumps • drains and drain points • vents and high points • leaks • other items • valve operation • strainers (pump, line or other) • drive head power units, belt tension and hydraulic oil levels • fuel gas system/desiccant • corrosion control system/cathodic protection • control/float valves
Levels	Levels may include: • chemical storage levels • lubricating oil levels • water and gas levels • battery levels • drain levels • other levels
Required calculations	Required calculations may include: • production figures • comparison of figures to targets

RANGE STATEMENT	
	• equipment efficiencies
Logs and reports	Logs and reports may be paper or electronic based and may also include verbal/radio reports Reports include reporting items found which require action
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problems using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person
Lease maintenance areas requiring action	Lease maintenance areas requiring action may include: • land erosion • fence and gate integrity • weeds and other growth • actions of feral or other fauna • other required items
Identified faults	Identified faults may include: • instrumentation failure/malfunction • electrical failure/malfunction • mechanical failure/malfunction • control system failure/malfunction • mismatch between flow rates and system requirements • wear, tear and corrosion of plant and equipment • quality measurement inaccuracy (e.g. analyser or sampling deficiency)
Typical problems	Typical problems may include: • leakage • solids (formation fines) • vibration

RANGE STATEMENT	
	• loss of control of pressure and/or flow • hydrate formation and blockages • liquid slugging • corrosion • erosion • sulphate reducing bacteria • scale formation • equipment failure • change in product parameters (e.g. temperature, flow, pressure and level) • fouling or contamination
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state, territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS335A Conduct pipeline pigging

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, an operations technician in/on a large plant/platform looks after the pig launching and receiving operations. The type of pigs used may include batching, cleaning, gauging, intelligent and foam pigs.

Application of the Unit

Application of the unit	Generally, the operations technician would be the key person in the team involved in the pigging operations and would be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team. The operations technician would: • understand the risks associated with pigging and closure mechanisms • prepare the pipeline system for pig launching and rectify any operational problems • prepare the pipeline system for pig receipt, and rectify any operational problems • interpret or assist in interpreting pigging data.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare the pipeline system for pigging (launching/receiving).	2.1. Liaise with the relevant people to ensure correct flow conditions are in the pipeline system prior to launching 2.2. Verify that all required permits have been issued 2.3. Prepare specified pig in accordance with requirements 2.4. Prepare pipeline for pigging operation in accordance procedures.
3. Launch, monitor progress and/or receive pig	3.1. Prepare launching and receiving scraper barrels and intermediate site for launching and receiving operations 3.2. Load the pig into the scraper barrel and launch 3.3. Calculate pig travel speed during the pig's progress 3.4. Monitor and track progress of the pig in the pipeline system 3.5. Take appropriate actions 3.6. Receive pig in accordance with legislative and enterprise procedural requirements

ELEMENT	PERFORMANCE CRITERIA
4. Interpret pigging data	4.1. Inspect the received pig to determine wear and/or other required information 4.2. Inspect, measure and or sample the waste material gathered during pigging operations as required 4.3. Take appropriate action 4.4. Dispose of waste materials to procedure 4.5. Record data accurately to assist with assessment of pipeline condition.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the pigging system and to distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- reasons for pipeline pigging and the type of pig used for each application
- prevention/mitigation measures for closure risks
- all items on a schematic of the pigging system and the function of each
- the nature/condition of materials/flows entering and leaving the scraper barrels during the launching and receiving operations
- correct valve sequences,
- expected system pressures for launching/receiving operations
- types of pigs and their purpose.
- principles of pigging
- physics and chemistry relevant to the pigs, pipes and materials
- process parameters and limits, eg temperature, pressure, flow, pH

REQUIRED SKILLS AND KNOWLEDGE

- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual pig/pipe and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of pigs and associated equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

Critical aspects for

Competence must be demonstrated in the ability to recognise and

EVIDENCE GUIDE	
assessment and evidence required to demonstrate competency in this unit	analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant/platform areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past incident history of pigging operations, pigging incidents from similar plants/platforms around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to pipeline pigging equipment over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.
Guidance information for assessment	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

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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the pigging system. For your operation this may include: • batching pigs • cleaning pigs • foam pigs • gauging pigs • intelligent pigs.
Pigging problems	Typical pigging problems may include: • closure seal failure resulting in hydrocarbon release and possible explosion • closure fastening mechanism fails and results in door striking technician • stuck pig • delayed pig • scraper enclosure leaks • leaking valves • damaged pig.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions

RANGE STATEMENT

	• standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS340B Operate cryogenic processes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the skills needed to operate and maintain complex refrigeration/cryogenic systems that involve multi-stage centrifugal compressors (or similar) and associated equipment, including computer control and monitoring systems. It does not cover small packaged refrigeration systems, which are covered by <i>MSAPMOPS100A Use equipment</i>.

Application of the Unit

Application of the unit	In this competency the operations technician would have a good understanding of the principles of refrigeration systems to a level that allows the operations technician to make adjustments to the system to achieve the required level of performance. The operations technician would typically understand: • different types of refrigerants and the relationship between vapour pressure and temperature • operating principles of each component of a large refrigeration system • methods of controlling refrigerant temperature • the objectives of refrigeration control. In a typical application, the operations technician would monitor the operation of the refrigeration system and: • make adjustments at the control panel/computer system to maintain the required operating parameters • carry out minor maintenance in accordance with procedures • identify situations requiring maintenance or repair outside the operator's skill level. The operations technician would also be responsible for starting up and shutting down the system, and making relevant checks on all parts of the system, including safety systems. In particular, the operations technician would identify hazardous situations arising from a malfunction of the system

	and take appropriate timely remedial action. At this level, the operations technician would also recognise and solve problems with the refrigeration system. This includes recognising indications of potential problems and taking appropriate and timely remedial action to ensure minimal loss of production time. This competency also covers identifying and controlling hazards related to large refrigeration systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel

ELEMENT	PERFORMANCE CRITERIA
2. Start up and shut down refrigeration system.	2.1. Carry out pre-start up checks of all items of the system, including safety systems 2.2. Start-up to procedures 2.3. Monitor the start-up process and take action as required to ensure operating parameters are achieved 2.4. Carry out general housekeeping of the system to procedures 2.5. Shut down to procedures 2.6. Perform emergency shut down of equipment (if required) 2.7. Record and/or communicate relevant information (if required).
3. Monitor and control refrigeration system.	3.1. Complete routine checks, logs and paperwork, taking appropriate action on unexpected observations, readings and trends 3.2. Recognise indications of actual or potential problems and take appropriate action to minimise the impact of problems on production time, safety, health and the environment 3.3. Recognise conditions likely to give rise to brittle fracture and take appropriate action 3.4. Identify critical exposure temperature (CET) and take appropriate action to minimise its impact 3.5. Monitor critical variables throughout the system and take appropriate action to maintain system operation 3.6. Make adjustments to maximise plant efficiency 3.7. Predict the need to make a change to meet process requirements 3.8. Make changes as required in a smooth and timely manner 3.9. Predict and communicate the impact on other parts of the plant that are reliant on the refrigeration system.
4. Isolate and de-isolate plant.	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

REQUIRED SKILLS AND KNOWLEDGE

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving

Required knowledge

Competence includes a comprehensive understanding of the role of the refrigeration system and its integral equipment in the overall operation of the plant. In particular it includes the ability to:

- identify and describe the function of all items of the refrigeration system

Competence includes a comprehensive understanding of the principles of refrigeration such as:

- block diagram of a refrigeration system
- basic principles of refrigeration
- types of industrial refrigerants and their applications
- the use of 'self refrigerants', ie the process fluid, such as ethylene or propylene, is also the refrigerant
- methods of controlling refrigeration systems, eg pressure regulation
- factors affecting performance.

It also requires a knowledge of:

- principles of operation of each item of equipment, eg heat exchangers, compressors, condensers, vaporisers, refrigerant drains, valves
- physics of operation
- brittle fracture, stress limits and the affects of thermal shock on materials of construction
- vapourisation, condensation and impact on process
- good operating practices
- contamination issues
- methods of resolving problems
- HAZCHEM symbols and codes.
- chemistry/physical chemistry relevant to the process unit and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies

REQUIRED SKILLS AND KNOWLEDGE

- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

EVIDENCE GUIDE	
	• early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with: • <i>PMAOPS304B Operate and monitor compressor systems and equipment.</i> In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i>
Guidance information for assessment	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

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.

Codes of practice/ standards	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 items of equipment such as: • large refrigeration systems that produce low temperatures • multi-stage centrifugal compressors • heat exchangers
Typical problems	Typical problems include: • maintaining required operating temperatures • recognising and acting upon unstable/sub-optimal operation, eg icing, moisture, fouling • controlling critical variables and outputs.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.

RANGE STATEMENT**Health, safety
and
environment
(HSE)**

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS350B Match and adjust colour

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the use of colour matching samples in comparing the colour of a product to the standard and then recommending adjustments to be made to bring the colour into the acceptable range.

Application of the Unit

Application of the unit	In a typical scenario, a technician prepares a colour sample, compares it to the standard and then recommends adjustments (if required) in order to bring the product's colour within the acceptable range. This may be done using a 'colour computer' or by eye. The adjustments would be by making additions to the batch to bring it into range without overshooting. The 'standard' might be for a product being manufactured or for a new product being developed. The ability to recommend adjustments is the critical element of this unit as this requires a significant understanding of colour. The technician would: • prepare a colour sample • analyse the colour sample and compare it to the standard • recommend adjustments to bring the batch into colour specification. Generally the technician would work alone while colour matching, but must be capable of communicating effectively with the relevant operating personnel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare colour sample.	1.1. Identify required sample properties 1.2. Select appropriate sample preparation method 1.3. Identify required sample preparation conditions 1.4. Adjust and control sample preparation conditions 1.5. Prepare colour sample.
2. Compare colour sample to standard.	2.1. Identify light conditions for comparison 2.2. Compare colour sample to standard using 'colour computer' as required 2.3. Compare colour sample to standard by eye as required 2.4. Reconcile data from each comparison if appropriate.
3. Recommend adjustments to batch.	3.1. Estimate the colourant additions needed to bring batch to standard 3.2. Recommend additions to relevant personnel as appropriate 3.3. Recommend additional mixing/processing requirements to procedure 3.4. Repeat sample preparation, colour matching and

ELEMENT	PERFORMANCE CRITERIA
	adjustment until correct colour is obtained.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
This competency requires the skills of: • discrimination • analysis • interpolation and extrapolation of data
Required knowledge
Competence includes an understanding of colour and how the pigments used interact with the process to develop the required colour in the final product. In particular it includes the ability to: • recognise hue, value and chroma (or colour/tone, lightness/shade and saturation) differences • describe the effect of a change of light conditions on the appearance of the colour for the pigment combination used as relevant to the product • recognise colourant addition and colourant dispersion differences • make judgements based on: • perceptibility • acceptability/tolerance • grade 1, 2 or 3 match as required by specification • describe the impact of opacity on colour as relevant to the product

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, the Range Statement and the Assessment Guidelines for the Training Package.

EVIDENCE GUIDE**Overview of assessment**

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- estimates of required adjustments are consistent with the colour match data
- adjustments are made cautiously and without overshooting
- adjustments are made efficiently with a minimum number of adjustments to bring the batch into specification.

These aspects may be assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the

EVIDENCE GUIDE	
	past incident history of the plant.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes the use of items of equipment required for colour sample preparation and colour matching. Sample properties may include: • surface finish • gloss • thickness • opacity • substrate properties.

RANGE STATEMENT	
	Sample preparation methods may include: • draw down • spraying • brushing. • moulding • casting • milling • pressing. Sample preparation conditions may include: • temperature • drying rate • time • pressure • volume. Colourants may include: • pigments • masterbatches • tinters.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS360A Operate a metalliferous kiln/furnace

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate a metalliferous kiln/furnace for the high temperature treatment of ores.

Application of the Unit

This unit applies to a plant technician who has the responsibility for the operation of a metalliferous kiln or furnace in an industrial scale metalliferous processing facility, including furnaces for calcining and roasting of ores.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit requires a detailed knowledge of the kiln/furnace and related equipment, operating processes at high temperatures, handling ore and very hot materials, procedures and metallurgy to the extent of being able to determine and apply the raw materials feed. Since the kiln/furnace may operate continuously for long periods of time, the plant technician will be expected to take over the operation from others and take responsibility for the operation whilst there. The plant technician would be expected to contribute to start-ups and shutdowns of the kiln/furnace.

This unit does NOT require the operation of a central control panel.

This unit has been written around the high temperature treatment of ores, usually below the metal melting point, so the feed and product are expected to be solids. This unit is not intended to include the handling of molten metal. However, it should also be applicable to other ores and materials with appropriate contextualisation.

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of the kiln/furnace against requirements
		1.7	Complete any required shift handover checks
2	Operate kiln/furnace	2.1	Identify the type of kiln/furnace and ancillary equipment
		2.2	Monitor and adjust air flows and other critical variables, as required
		2.3	Change rate, grade or specification smoothly, as required

		2.4	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends
		2.5	Liaise with others to ensure that the discharge product is appropriate
3	Recognise problems and take appropriate action	3.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		3.2	Recognise developing situations which may require action
		3.3	Adjust feeds, composition and rate, gas flows and temperatures, as appropriate, to meet product requirements
		3.4	Take other appropriate actions on problems, as required
		3.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
4	Make plant safe for work and prepare for return to duty	4.1	Take part in the preparations for maintenance or upgrade work on the kiln/furnace or ancillary equipment
		4.2	Shut down plant as required
		4.3	Make equipment and area safe for required work
		4.4	Check plant is ready to be returned to service
		4.5	Prepare plant for return to service
		4.6	Complete any pre-start checks
		4.7	Start up plant as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- identifying hazards and safe operating procedures for handling high temperatures and very hot materials
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- applying mathematics to the level of understanding and determination of raw material feed rates and composition

Required knowledge

Required knowledge, to the breadth and depth required for the operation of the kiln/furnace systems, includes:

- principles of operation of kiln/furnace and ancillary equipment
- knowledge of metallurgy/materials properties, to the extent of determining effects of varying kiln/furnace conditions, raw materials feed rates, quality, composition and proportions on finished product composition
- process parameters and limits (e.g. temperature, air pressures/flows, materials flow rates and fuel pressure/flow)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- interlocks and their purpose
- physics and chemistry relevant to each unit and the processes used
- relevant environmental and heritage requirements
- mathematical formulae and their application to determining feed rates and materials properties

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention, or with potential problems, are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not

limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- variations in feed material
- control of air flow
- control of fuel flow
- control of feed rates and composition of feeds
- control of output product

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take

precedence.

Start up/shut down as required

Start-up/shutdown as required includes:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold or empty
- all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS361A Operate a smelting furnace

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate a smelting furnace.

Application of the Unit

This unit applies to a plant technician who has the responsibility for the operation of a smelting furnace in an industrial scale metalliferous processing facility.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit requires a detailed knowledge of the smelting furnace and related equipment, operating processes at high temperatures, handling molten metal, procedures and metallurgy to the extent of being able to determine and apply the raw materials feed. The plant technician will be expected to take over the operation from others and take responsibility for the operation whilst there. The plant technician would be expected to contribute to start-ups and shutdowns of the smelting furnace, but it is understood that this may be the responsibility of others.

This unit does NOT require the operation of a central control panel.

This unit has been written with ore smelting furnaces in mind, where the feed is in the form of ore, crushed rock or a mixture which may include flux materials and the product is molten metal and slag. However, it should also be applicable to other metals or ores with appropriate contextualisation.

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of the blast furnace against requirements
		1.7	Complete any required shift handover checks
2	Operate smelting furnace	2.1	Identify the type of smelting furnace and ancillary equipment
		2.2	Change rate, grade or specification smoothly, as required
		2.3	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends

		2.4	Liaise with others to ensure that the discharge product is appropriate
3	Recognise problems and take appropriate action	3.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		3.2	Recognise developing situations which may require action
		3.3	Adjust feeds, composition and rate, gas flows and temperatures, as appropriate, to meet product requirements
		3.4	Take other appropriate actions on problems, as required
		3.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
4	Make plant safe for work and prepare for return to duty	4.1	Take part in the preparations for maintenance or upgrade work on the smelting furnace or ancillary equipment
		4.2	Make equipment and area safe for required work
		4.3	Check plant is ready to be returned to service
		4.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- identifying hazards and safe operating procedures for handling high temperatures and

molten metal

- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- applying mathematics to the level of understanding and determination of raw material feed rates and composition

Required knowledge

Required knowledge, to the breadth and depth required for the operation of the smelting furnace, includes:

- principles of operation of smelting furnace and ancillary equipment
- knowledge of metallurgy, to the extent of determining effects of varying furnace conditions, raw materials feed rates, quality, composition and proportions on finished product composition
- process parameters and limits (e.g. temperature, feed rates and gas/flux/catalyst/additives rates)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- physics and chemistry relevant to each unit and the processes used
- relevant environmental and heritage requirements
- mathematical formulae and their application to determining feed rates and materials properties

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are

unit

recognised

- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures

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

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to resolve to designated person

Typical problems

Typical problems may include, but are not limited to:

- variations in feed material
- control of gas flow
- control of feed rates, and composition of feeds
- control of tapping rates of slag and molten product

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Work requirements

Work requirements may come from briefings, handovers and work orders and may include:

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions

- lighting conditions
- plant or equipment defects
- hazards and potential hazards
- coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS362A Operate a blast furnace

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate a blast furnace.

Application of the Unit

This unit applies to a plant technician who has the responsibility for the operation of a blast furnace in an industrial scale metalliferous processing facility.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit requires a detailed knowledge of the blast furnace and related equipment, operating processes at high temperatures, handling molten metal, procedures and metallurgy to the extent of being able to determine and apply the raw materials feed. Since the blast furnace will operate continuously for long periods of time, the plant technician will be expected to take over the operation from others and take responsibility for the operation whilst there. The plant technician would be expected to contribute to start-ups and shutdowns of the blast furnace, but it is understood that this major event will principally be the responsibility of others. The handling of rock, ore and other solid raw materials and of molten metal and slag as products are included.

This unit does NOT require the operation of a central control panel.

This unit has been written with iron and lead blast furnaces in mind. However, it should also be applicable to other metals or ores with appropriate contextualisation.

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of the blast furnace against requirements
		1.7	Complete any required shift handover checks
2	Operate blast furnace	2.1	Identify the type of blast furnace and ancillary equipment
		2.2	Change rate, grade or specification smoothly, as required
		2.3	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends

		2.4	Liaise with others to ensure that the discharge product is appropriate
3	Recognise problems and take appropriate action	3.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		3.2	Recognise developing situations which may require action
		3.3	Adjust feeds, composition and rate, air flows and temperatures, as appropriate, to meet product requirements
		3.4	Take other appropriate actions on problems, as required
		3.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
4	Make plant safe for work and prepare for return to duty	4.1	Take part in the preparations for maintenance or upgrade work on the blast furnace or ancillary equipment
		4.2	Make equipment and area safe for required work
		4.3	Check plant is ready to be returned to service
		4.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- identifying hazards and safe operating procedures for handling high temperatures and

molten metal

- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- applying mathematics to the level of understanding and determination of raw material feed rates and composition

Required knowledge

Required knowledge, to the breadth and depth required for the operation of the blast furnace systems, includes:

- principles of operation of blast furnace and ancillary equipment
- knowledge of metallurgy, to the extent of determining effects of varying blast furnace conditions, raw materials feed rates, quality, composition and proportions on finished product composition
- process parameters and limits (e.g. temperature, pressure and flow)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- physics and chemistry relevant to each unit and the processes used
- relevant environmental and heritage requirements
- mathematical formulae and their application to determining feed rates and materials properties

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised

- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures

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

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by

industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- variations in feed material
- control of gas flow
- control of feed rates and composition of feeds
- control of tapping rates of slag and molten product

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Work requirements

Work requirements may come from briefings, handovers and work orders and may include:

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions
- lighting conditions
- plant or equipment defects

- hazards and potential hazards
- coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS364A Operate an electrochemical process

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate an electrochemical process in the metalliferous industry. This includes electrowinning, electrorefining or other electrolysis process for the extraction of metal from other ore materials.

Application of the Unit

This unit applies to a plant technician who has the responsibility for the operation of an electrochemical process in an industrial scale metalliferous processing facility, for the production of metals. This includes other electrolytic processes, such as electrorefining, electrowinning and other electrolytic cells. It is not intended to apply to processes where the electricity is just a heating mechanism.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit requires a detailed knowledge of the electrochemical process, including the handling and stripping of electrodes, and handling of the solutions. It also covers dealing with the associated hazards, such as very high electric currents, high temperatures and/or corrosive or hazardous solutions. The plant technician would be expected to conduct start-ups, shutdowns and isolation of cells, and contribute to the periodic shutdown and start-up of cells for major maintenance or refurbishment.

This unit does NOT require the operation of a central control panel.

This unit has been written with electrochemical processes for the extraction of metals from their ores, such as electrowinning of copper, zinc, nickel and other metals, where the metal is extracted from an ore solution and electrorefining of copper from blister copper, lead, nickel, silver and other metals, where the metal is purified by electroplating pure metal from an intermediate product. However, it should also be applicable to other metals or ores with appropriate contextualisation. Although aluminium is produced by an electrolytic process, this is covered by other competencies and is not included here.

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of the cells against requirements
		1.7	Complete any required shift handover checks

2	Operate electrochemical process	2.1	Identify the type of electrochemical equipment, cells and ancillary equipment
		2.2	Adjust solution volume, feed quality, temperatures, electrical current, voltage and production rate, as required
		2.3	Pull and strip plates/electrodes as required and to procedures
		2.4	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends
3	Recognise problems and take appropriate action	3.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		3.2	Recognise developing situations which may require action
		3.3	Adjust feeds, temperatures, electrical current and voltage, as appropriate, to meet product requirements
		3.4	Take other appropriate actions on problems, as required
		3.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
4	Make plant safe for work and prepare for return to duty	4.1	Take part in the preparations for maintenance or upgrade work on the electrochemical or ancillary equipment
		4.2	Shut down plant as required
		4.3	Make equipment and area safe for required work
		4.4	Check plant is ready to be returned to service
		4.5	Prepare plant for return to service
		4.6	Start up plant as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- identifying hazards and safe operating procedures for handling high temperatures and hazardous materials and solutions
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- applying mathematics to the level of understanding and determination of raw material feed rates and composition

Required knowledge

Required knowledge, to the breadth and depth required for the operation of the electrochemical process, includes:

- principles of operation of electrochemical process and ancillary equipment
- knowledge of metallurgy, to the extent of determining effects of varying conditions in the cells or process, raw materials feed rates, quality, composition and proportions on finished product composition
- process parameters and limits (e.g. temperature, flow and electrical parameters, where applicable)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- physics and chemistry relevant to each process unit and the processes used
- relevant environmental and heritage requirements
- mathematical formulae and their application to determining feed rates and materials properties

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analyzed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competence will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- variations in feed material
- control of temperature
- control of feed rates and composition of feeds
- control of impurities, waste material and irregularities

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not

be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Work requirements

Work requirements may come from briefings, handovers and work orders and may include:

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions
- lighting conditions
- plant or equipment defects
- hazards and potential hazards
- coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS365A Operate pelletising equipment

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate typical pelletising equipment as used in a metalliferous minerals processing plant. It also includes solving problems with pelletising processes and the equipment, including ancillary equipment.

Application of the Unit

This unit applies to a person who has the responsibility for starting up, shutting down and operating pelletising equipment to procedures, and making adjustments (e.g. feed rate) to the pelletising equipment.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit does not cover sintering equipment, which is covered by:

- *PMAOPS366A Operate sintering equipment*

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of pelletising plant/equipment
		1.7	Complete any required pre-start checks
2	Operate pelletising equipment	2.1	Identify the type of pelletising equipment
		2.2	Start up and shut down pelletising equipment according to the pelletising equipment type and duty
		2.3	Adjust feed rate, pressure and temperature as appropriate to type of pelletising equipment
		2.4	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends
3	Operate ancillary equipment	3.1	Monitor critical variables, such as amps, temperature and vibration
		3.2	Keep critical variables in range

		3.3	Recognise trends/patterns which indicate a potential or actual problem with the ancillary equipment
		3.4	Take appropriate action to ensure ancillary equipment is returned to full performance in a timely manner
4	Recognise problems and take appropriate action	4.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		4.2	Recognise developing situations which may require action
		4.3	Make appropriate adjustments to pelletising equipment and duty
		4.4	Take other appropriate actions on pelletising problems, as required
		4.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
5	Isolate and de-isolate plant	5.1	Isolate plant
		5.2	Make safe for required work
		5.3	Check plant is ready to be returned to service
		5.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- efficient and effective operation of plant/equipment
- recognising conditions which will lead to out of specification operation

- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- applying mathematics required for monitoring and responding to trends

Required knowledge

Required knowledge of pelletising equipment principles and typical problems, to a level needed to control the operation, includes:

- principles of operation of pelletising plant/equipment
- process parameters and limits (e.g. feed rate, temperature and pressure)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- function and troubleshooting of major internal components and their problems, such as internals, supports, conveyors and feeders
- relevant environmental and heritage requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria required skills and knowledge range statement and the Assessment Guidelines for the Training Package.

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance

- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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.

Context

This competency includes all types of pelletising equipment/processes, including, but not limited to:

- grate-kiln processes
- travelling grate processes

The pelletising includes processes, such as:

- mixing
- balling
- indurating

Ancillary equipment

Ancillary equipment may include, but is not limited to:

- conveyors
- feeders

Procedures

- rollers

Procedures may be written, verbal, computer-based or in some other form. They may include but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- blockages/build-up/fouling
- erosion/wear
- ancillary equipment problems

Remedial actions

Remedial actions may include but are not limited to:

- making adjustments to the equipment (e.g. feed rate and temperature)
- carrying out minor maintenance within operator's skill level

	• identifying and reporting problems outside operator's scope of ability • identifying and controlling hazards related to pelletising equipment and surrounding areas
Start up and shut down as required	Start up and shut down as required includes: • start up and shut down to/from normal operating conditions • start up and shut down to/from isolated, cold, empty • all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Work requirements	Work requirements may come from briefings, handovers and work orders and may include: • compliance documentation • product specifications • nature and scope of tasks • achievement targets • operational conditions • lighting conditions • plant or equipment defects • hazards and potential hazards • coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS366A Operate sintering equipment

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to operate typical sintering equipment as used in a metalliferous minerals processing plant. It also includes solving problems with sintering processes and the equipment.

Application of the Unit

This unit applies to a person who has the responsibility for starting up, shutting down and operating sintering equipment to procedures, and making adjustments (e.g. feed rate and temperature) to the sintering equipment.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit does not cover pelletising equipment, which is covered by:

- *PMAOPS365A Operate pelletising equipment.*

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control hazards
		1.3	Coordinate with appropriate personnel
		1.4	Check for recent work undertaken on plant
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of sintering plant/equipment
		1.7	Complete any required pre-start checks
2	Operate sintering equipment	2.1	Identify the type of sintering equipment
		2.2	Start up and shut down sintering equipment according to the sintering equipment type and duty
		2.3	Adjust feed rate, suction rate and temperature as appropriate to type of sintering equipment
		2.4	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends
3	Operate cooling and screening equipment	3.1	Monitor critical variables such as temperature, depth of sinter, sinter size
		3.2	Keep critical variables in range

		3.3	Recognise trends/patterns which indicate a potential or actual problem with the cooling and screening equipment
4	Recognise problems and take appropriate action	4.1	Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		4.2	Recognise developing situations which may require action
		4.3	Make appropriate adjustments to sintering equipment and duty
		4.4	Take other appropriate actions on sintering problems, as required
		4.5	Identify upstream and downstream impacts of any adjustment made or variation in conditions
5	Isolate and de-isolate plant	5.1	Isolate plant
		5.2	Make safe for required work
		5.3	Check plant is ready to be returned to service
		5.4	Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- efficient and effective operation of plant/equipment
- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment

- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- applying mathematics required for monitoring and responding to trends

Required knowledge

Required knowledge of sintering equipment principles and typical problems, to a level needed to control the operation, includes:

- principles of operation of sintering plant/equipment
- process parameters and limits (e.g. feed rate, temperature and suction rate)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems and the resolution of those problems
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, and problem solving of each
- physics and chemistry relevant to each unit and the processes used
- function and troubleshooting of major internal components and their problems, such as internals, supports, discharge chutes and feeders
- relevant environmental and heritage requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria required skills and knowledge range statement and the Assessment Guidelines for the Training Package.

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

Critical aspects for assessment and evidence are:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are

recognised and an appropriate contribution made to their solution.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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.

Context

This competency includes all types of sintering equipment/processes, including, but not limited to:

- travelling grate
- emission optimised sintering (EOS)

Procedures

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by

industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility/ability to resolve to designated person

Typical problems

Typical problems may include, but are not limited to:

- moisture content
- blockages in discharge chutes
- debris/build-up on roll feeder
- pallet seal and wind box leakage

Remedial actions

Remedial actions may include, but are not limited to:

- making adjustments to the equipment (e.g. feed rate and temperature)
- carrying out minor maintenance within operator's skill level
- identifying and reporting problems outside operator's scope of ability
- identifying and controlling hazards related to sintering equipment and surrounding areas

Start up and shut down as required

Start up and shut down as required includes:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold, empty
- all other conditions experienced on the plant (i.e.

from any condition to any condition experienced on the plant)

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Work requirements

Work requirements may come from briefings, handovers and work orders and may include:

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions
- lighting conditions
- plant or equipment defects
- hazards and potential hazards
- coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS390B Operate a biochemical process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, a plant uses a biochemical process to produce chemical or biological materials which are the product of that plant. The process may use enzymes such as amylases, moulds such as yeasts and/or bacteria such as e coli. The product may be a chemical compound such as alcohol (which may be able to be produced by chemical synthesis) or biochemical products such as enzymes or proteins.

Application of the Unit

Application of the unit	This unit includes the operation of all associated pumps, dosing pumps, agitation, aeration (if appropriate), temperature control and similar equipment which is integral to the operation of the biochemical process. While biochemical processes are often batch, this unit also applies to continuous biochemical processes. This unit does not apply to ambient temperature biotreating such as might be typical of a waste stream biotreater - see <i>PMAOPS290B Operate a biotreater</i>. This unit does not require the operation of a central control panel. Where the operation of a central control panel is part of the job, <i>PMAOPS305B Operate process control systems</i> is relevant. The plant technician would: • identify and rectify operational problems • predict the potential impact of changes from other plant sections on biochemical process • facilitate output changes.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Monitor and control the biochemical processes.	2.1. Get information relevant to the operation of the biochemical process 2.2. Identify changes in key variables 2.3. Keep conditions within the optimum range 2.4. Check performance of ancillaries such as agitation and heat exchange 2.5. Recognise and interpret trends in bioreactor data/appearance 2.6. Recognise the signs of potential and actual problems 2.7. Identify the consequences to the bioreactor processes of the identified changes, trends and problems 2.8. Take appropriate action to minimise the impact on safety, health, the environment and the business of potential and actual problems.

ELEMENT	PERFORMANCE CRITERIA
3. Ramp output up/down.	3.1. Predict from rates and schedule when a change will be required 3.2. Give advanced notice of change to work team 3.3. Prepare plant for the change 3.4. Predict the required amount of adjustment to cause the required change 3.5. Make the change in a controlled manner without excessive variation 3.6. Monitor the progress of the change and make minor adjustments as required.
4. Maintain effectiveness of bioreactor system.	4.1. Frequently and critically monitor bioreactor system throughout shift 4.2. Use measured/indicated data and smell, sight, sound and feel as appropriate 4.3. Identify critical equipment and processes 4.4. Identify issues likely to impact on the whole plant performance and take appropriate action 4.5. Predict impact of a change in the bioreactor system on other plant units/areas and communicate this to relevant people 4.6. Predict impact of a change in the processing plant on the bioreactor 4.7. Take appropriate action
5. Shut down reaction systems.	5.1. Determine type of shut down required 5.2. Give advance warning of shut down where possible 5.3. Change over individual items of equipment 5.4. Shut down individual items of equipment and the entire bioreactor system 5.5. Shut down to a stand-by condition if required 5.6. Shut down for maintenance when required. 5.7. Shut down in an emergency when required
6. Clean reactors/vessels.	6.1. Identify cleaning requirements 6.2. Clean to requirements according to procedures 6.3. Retain micro-organisms contained in the plant and prepare for reuse as appropriate 6.4. Dispose of waste materials according to procedures.
7. Isolate and de-isolate plant.	7.1. Isolate plant 7.2. Make safe for required work 7.3. Check plant is ready to be returned to service

ELEMENT	PERFORMANCE CRITERIA
	7.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving

Required knowledge

Competence includes an understanding of the bioreactor system and its integral equipment to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the bioreactor system and describe the function of each
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- state the biochemical changes which are occurring in each stage and the methods of controlling them
- describe methods of ramping up/down in to change output and the advantages and disadvantages of each.

Required knowledge also includes:

- principles of operation of plant/equipment
- physics, chemistry, biochemistry and microbiology relevant to the process unit and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling process

REQUIRED SKILLS AND KNOWLEDGE

- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are

EVIDENCE GUIDE	
	recognised - the range of possible causes can be identified and analysed and the most likely cause determined - appropriate action is taken to ensure a timely return to full performance - obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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
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 if the

RANGE STATEMENT	
candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the bioreactor system. For your plant this may include (select relevant items): • pumps (feed and dosing pumps) • utilities and services such as air • agitators • air/gas supply/removal • temperature control equipment such as heaters, coolers, heat exchangers • other equipment integral to the operation of the bioreactor system.
Typical problems	Typical problems for your plant may include: • sudden changes in feed (rate, composition, concentration) • changes in required production rate • changes in ambient conditions, eg summer to winter operation • handling a plant shutdown without allowing the micro-organisms to die • control of degree of agitation • settling/removal/recycling of micro-organisms. • feed variations • instrument failure/wrong reading • electrical failure • mechanical failure • operational problem.
Key variable	Key variables include: • feed • desired output • temperature • agitation • aeration (if appropriate) • microorganism/enzyme
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of

RANGE STATEMENT	
	responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS402A Respond to abnormal process situations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit applies an in depth knowledge of process and plant to the recognition and solving of more complex/less obvious process/plant/ technical problems.

Application of the Unit

Application of the unit	In a typical scenario, a senior technician or para-professional investigates a plant unit/part of the process which is not performing as well as it has/as expected. They methodically investigate this technical problem, come to a conclusion as to the cause and then initiate appropriate corrective action. The corrective action may well be beyond the scope of competency and responsibility of the person to implement. This unit applies to problems which are not solvable by direct observation and require systematic investigation: • damage to/wear of tower trays • internal leaks of heat exchangers • collapse of/channelling in tower/column/vessel packing The technician would: • clarify the problem • analyse problem cause(s) • recommend a solution to the problem. Generally the technician would work alone for this unit, although the ability to communicate with all internal and external stakeholders is vital.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	MSAPMSUP390A	<i>Use structured problem solving tools</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Recognise there is a problem.	1.1. Compare current performance with expected/historic performance 1.2. Identify plant/process areas with poor performance 1.3. Check the impact of routine adjustments to improve performance 1.4. Identify problems not solved by the routine solutions.
2. Define the problem.	2.1. Apply problem isolation techniques to isolate problem to a small part of the plant/process 2.2. Quantify the effect of the problem in operational terms 2.3. Postulate possible causes of the problem 2.4. Identify types of evidence for each possible cause 2.5. Investigate problem to accumulate evidence of cause type 2.6. Analyse data to confirm cause of problem 2.7. Determine the level of severity of the problem, priority of any required action.
3. Develop solution.	3.1. Discuss possible solutions to cause with relevant people 3.2. Determine whether a quick fix is needed

ELEMENT	PERFORMANCE CRITERIA
	3.3. Arrange for implementation of quick fix if required 3.4. Check effectiveness of quick fix and take appropriate action 3.5. Agree required solution with appropriate people 3.6. Arrange for required solution to be undertaken in appropriate time frame 3.7. Follow items initiated through until final resolution has occurred 3.8. Check effectiveness of solution and take appropriate action 3.9. Complete reports to procedure.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

This unit requires skills of:

- analysis
- problem solving
- negotiation
- communication
- basic mathematics

Required knowledge

Competence includes a deep understanding of:

- plant equipment, its characteristics and limitations
- impact of variations in plant/process and the distinctive signs of each variation
- process chemistry, physics and biochemistry as relevant, eg to the extent of writing chemical equations and identifying factors controlling reaction rate and yield or equivalent
- problem isolation techniques
- problem analysis techniques
- organisation approval 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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include a range of problems, problem causes and environments.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual problems and should include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios.

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

Competence must be demonstrated in the ability to define and analyse the problem as well as deal with the stakeholders. The stakeholders should be satisfied with the solution, as well as the solution being technically sound.

Consistent performance should be demonstrated. In particular look to see that:

- different types of problems can be analysed and resolved
- different types of stakeholders can be satisfied
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past history and similar sources.

Context of and specific resources for

Assessment will require a suitable method of

EVIDENCE GUIDE	
assessment	gathering evidence of problem solving ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes problems in the plant, plant equipment or process which may make itself evident through lower quality, lower rates, greater variability or greater difficulty in control.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS405B Operate complex control systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the operation of a complex control panel. These controllers use a large number of control loops and a broad range of control algorithms. The panel will control entire plant areas and multiple products/ process streams. It will typically be located off plant in a control room and will require managing multiple complex tasks.

Application of the Unit

Application of the unit	In a typical scenario an operations technician uses a complex process control system to operate and monitor an entire plant area consisting of several plant units/systems. This control system would typically be an advanced control system and may include operation of simpler control systems as part of its operation. This panel technician/central control room operator has an overall responsibility for the operation of all units of equipment within the entire plant area and may include optimization of the area using the control system. As such they often also take a lead role as part of the operating team. Competencies required by this role other than panel competencies as such are not covered by this unit. The operations technician would: • monitor and operate equipment in the entire plant area • solve process problems related to the plant area • liaise with other plant areas as necessary • use the advanced control features of the control system Generally the operations technician would be part of a team during start up, shut down and normal operating conditions and would be expected to be capable of demonstrating competence in all parts of this unit. He/she would be taking a leading role in liaising and cooperating with other members of the team. Typically the panel operator will liaise with other 'outside operators', however this unit does not preclude the situation where the panel operator may also undertake 'outside' functions.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use operator interface.	1.1. Use keyboards, track ball and monitor and/or stand alone controllers to access control system/panel 1.2. Monitor the process using the operator interfaces 1.3. Select appropriate controller modes 1.4. Access historical data and information 1.5. Acknowledge messages and alarms 1.6. Access advanced control features as appropriate
2. Access control information.	2.1. Obtain relevant data and information from the control system by applying systems knowledge 2.2. Identify the status of individual pieces of equipment from the control panel and use information to identify

ELEMENT	PERFORMANCE CRITERIA
	potential faults 2.3.Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics 2.4.Determine the overall operating effectiveness of the plant area related to the required targets for the area 2.5.Record process variations/irregularities to procedures.
3. Control process variations and monitor operations.	3.1.Use historical data to assist the identification of problems 3.2.Process available information to identify potential faults 3.3.Undertake required set point/output changes to meet plant area and process requirements 3.4.Adjust production in response to test results and control panel information 3.5.Monitor key process and environmental variables and take appropriate action 3.6.Adjust controller settings in accordance with procedures 3.7.Use advanced control features as appropriate 3.8.Optimise entire plant area in accordance with guidelines 3.9.Undertake calibration operations as appropriate 3.10. Coordinate with stakeholders external to the plant area as appropriate 3.11. Record adjustments and variations to specifications/schedules 3.12. Communicate to appropriate personnel as required.
4. Facilitate planned and unplanned process start-ups and shut-downs.	4.1.Select and apply procedures to planned startup and shutdown processes 4.2.Select and apply procedures to unplanned shutdown processes 4.3.Implement all required emergency responses 4.4.Communicate necessary information to all personnel affected by events 4.5.Log all required information.
5. Respond to alarms or out of specification conditions.	5.1.Identify system(s) affected by the alarm or condition 5.2.Interpret alarms and prioritise actions to be taken

ELEMENT	PERFORMANCE CRITERIA
	5.3. Respond to the alarm or incident by following procedures 5.4. Deal with any out of specification material in accordance with procedures 5.5. Communicate the problem/solution to appropriate personnel 5.6. Record the information as required 5.7. Provide details of the alarm and action taken to the next shift at change over 5.8. Follow the incident up see that appropriate action has been taken.
6. Control hazards.	6.1. Identify hazards in the production/processing work area 6.2. Assess the risks arising from those hazards 6.3. Implement measures to control risks in line with procedures and duty of care
7. Resolve other problems within scope of responsibility.	7.1. Identify possible problems in equipment, control systems or process 7.2. Determine problems needing action 7.3. Determine possible fault causes 7.4. Rectify problem using appropriate solution within area of responsibility 7.5. Follow initiated items through until final resolution has occurred 7.6. Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction

REQUIRED SKILLS AND KNOWLEDGE

- mechanical failure/malfunction
- equipment design deficiencies
- product parameters (temperature, flows, pressure and levels)
- process control system malfunction
- power/utility failures
- software problems
- multitasking.

An ability to communicate with other work groups and personnel during the operation and monitoring of this panel is considered to be an essential element of this unit of competency.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- advanced control features
- interactions between control loops
- interactions between plant units within the entire plant
- the architecture and location of the process/production equipment
- specific plant process operations
- interactions between plant items/processes
- product specifications and tolerances
- systems operating parameters
- system integrity limits
- process control philosophies and strategies
- emergency shutdown procedures
- process specific physics, chemistry and mathematics
- relevant chemistry of the process to the level of writing chemical equations and identifying and manipulating factors controlling rate of reaction and yield (or equivalent physics for a physical process/biochemistry for a biochemical process) - chemistry to include both intended products and interfering reactions (eg salts, hydrates)
- basic science of upstream and downstream processes
- interactions between plant area and other value stream members
- impact of external factors, eg variations in weather, feed etc
- complex process drawings, eg P&ID, PFD, cause and effect
- basis of control for the plant/s
- instrumentation and control systems including feed forward, feed back and open control
- instrumentation and control system components (eg relevant primary sensing devices, final control elements, transducers/transmitters)
- control loops (including PID control, set points, controlled variable, indicated variable)
- interaction between multiple control loops (including cascade control)
- impacts of changing controller settings and the limits within which changes can be made
- effective communication techniques

REQUIRED SKILLS AND KNOWLEDGE

- organisation procedures
- UPS and its applications and use.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practiced in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the process control system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responses. The emphasis should be on the ability to stay out of

EVIDENCE GUIDE	
	trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to a process control system over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, communication and leadership units.
Guidance information for assessment	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

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 italicized 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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the control system. For your control room this may include (select relevant items): • process control systems (eg Distributed Control Systems) • use of multiple control systems • personal computers • printers • fire and gas detection/protection systems • emergency shutdown systems • communications systems. Typical problems for your plant may include: • operating without advanced control features • loss of power/utilities • analysing failure modes • variation/loss of feed • unstable control of pressure, temperature level and flows • control equipment failure • process plant trips • change in atmospheric conditions (rain, temperature, wind, lightning) • emergency situations.
Alarms or abnormal conditions	Alarms or other abnormal conditions includes: • emergency, including emergency shut down • partial or complete controller failure.
Other problems	Other problems includes: • problem solving control functions
Appropriate action	Appropriate action includes: • determining problems needing action

RANGE STATEMENT	
	• determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS410B Monitor remote production facilities

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, a technician in a central location looks after the operation of a remote production facility. This may be achieved by using ground based or satellite communications systems. The competency covers the operation and management of remote plants, treatment stations or satellite locations.

Application of the Unit

Application of the unit	Typically these stations may include: • wellheads • separation facilities • utility systems • remote pumping and compression stations • remote plants • fire and gas safety systems and associated piping and instrumentation. The operations technician would: • identify and rectify operational problems • conduct well testing • conduct critical function testing. Control of a remote production facility may require operation and process monitoring via a remote control system. Generally the operations technician would operate independently and be expected to be capable of performing all parts of this unit. However they may be part of a team during critical inspections or maintenance operations. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Conduct product separation.	2.1. Centralise and prepare well products for initial multi-phase separation, storage and distribution as determined by the required production targets and objectives 2.2. Use multi-phase high and low pressure separation, utilising heat and chemical treatments, to effectively separate the product 2.3. Monitor the separation process via control room operation to ensure all product flows, pressures and temperatures are maintained within correct operating parameters 2.4. Operate and monitor all required utility services to assist in the separation process.
3. Recover and measure product.	3.1. Transfer treated waste water from the separation process for further treatment as required prior to re-injection or disposal 3.2. Ensure that all available product is recovered and all waste water

ELEMENT	PERFORMANCE CRITERIA
	is made safe for further use or disposal within environmental limits 3.3.Measure and sample produced gas as required 3.4.Measure collected product to determine the level of available stocks for further transfer and for accounting purposes 3.5.Take appropriate action.
4. Transfer product.	4.1.Check transfer process equipment required to ensure it is working within agreed operating parameters 4.2.Transfer product to a processing facility for further treatment and enhancement 4.3.Monitor transfers and take appropriate action 4.4.Log and record all product transfers and communicate as required 4.5.Distribute data collected to appropriate personnel.
5. Isolate and de-isolate plant.	5.1.Isolate plant 5.2.Make safe for required work 5.3.Check plant is ready to be returned to service 5.4.Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the compressor system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- product contamination
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problems
- pressure losses and leakage.

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

The knowledge referred to in the Evidence Guide for this unit includes:

- all items on a schematic of the remote system and the function of each
- nature/condition of materials entering and leaving each stage of the process
- changes which have occurred in that stage and why they have occurred
- methods of changing production rates and the advantages and disadvantages of each
- effect of specific climatic and environmental factors
- water testing and gas break through testing techniques
- storage and transfer techniques related to the transport of oil, gas or water.
- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit and the fluids involved
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling plant
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of

EVIDENCE GUIDE

	parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the operation of the remote facility and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

EVIDENCE GUIDE	
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	Consider co-assessment with other units relevant to the job.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the remote facility. For your enterprise this may include (select relevant items): • valves • pumps • prime movers • compressors • separators • instrumentation • storage tanks, ponds and dams • filters • wellheads

RANGE STATEMENT	
	- hydraulic well control panels - fire and gas safety systems.
Typical problems	Typical problems for your plant may include: - contamination of product - control of temperature and pressure - variations in feed - vibration.
Appropriate action	Appropriate action includes: - determining problems needing action - determining possible fault causes - rectifying problem using appropriate solution within area of responsibility - following through items initiated until final resolution has occurred - reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: - all work instructions - standard operating procedures - formulas/recipes - batch sheets - temporary instructions - any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS411B Manage plant shutdown and restart

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the co-ordination of the shutdown and restarting of a production process in a safe and efficient manner due to a planned or an unplanned shutdown or emergency situation. It does not apply to individual plant operators shutting down individual production units or following directions during a shutdown, as this is included in the normal unit of competency for operating that production unit.

Application of the Unit

Application of the unit	In a typical scenario, a complex and integrated plant (usually but not necessarily large and continuous) needs to be shut down for some reason. Shutting down is a complex process and is more than the simple turning off of a switch. This competency would typically be exercised by the leading plant technician on a shift. This unit requires the exercise of discretion as the plant technician's responses are governed by the cause of the shutdown and the plant's responses to that. They are required to adapt normal practice, within the overall guidelines, to the current situation to obtain the best outcome. This competency requires the coordination of all personnel involved in the shutdown to ensure it happens in as orderly a fashion as possible and that the plant is left in the best condition possible for a quick restart. The person exercising this competency needs to balance the varying requirements to ensure the shutdown occurs with maximum safety to personnel, plant, the environment and the business's productivity (in that order).

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Manage shutdown sequence.	1.1. Check and verify safety systems to ensure that the unit has been made safe 1.2. Identify the reason for, or cause of the shutdown by troubleshooting the system and by utilising all available data and information systems 1.3. Obtain confirmation of the identified shutdown from field based operators to verify both the nature and the reliability of the shutdown 1.4. Rectify or initiate procedures to rectify the fault or shutdown cause through either repair of the operational fault or readjustment before returning the system to start-up status.
2. Conduct start-up process.	2.1. Satisfy all start-up permissives prior to start-up process being commenced 2.2. Conduct start-up according to procedures and in a safe and efficient manner, ensuring a return to steady state operation is achieved.
3. Document shutdown and	3.1. Complete all logs and workplace documentation relating to the shutdown/start-up process, ensuring all details, actions and

ELEMENT	PERFORMANCE CRITERIA
start-up process.	responses are accurately recorded 3.2. Record any further ongoing production problems and report to appropriate persons or authority.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes:

- efficient and effective planning of shut down/start up
- hazard analysis
- completing plant records
- communication
- problem solving

Required knowledge

Demonstration of competence in this unit must include knowledge of the following:

- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit and the materials processed
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility.
- architecture of the process/production systems
- the plant
- product specifications and tolerances
- systems operating parameters

REQUIRED SKILLS AND KNOWLEDGE

- process control philosophies and strategies
- the process
- emergency shutdown procedures
- physics, chemistry and mathematics relevant to the process
- outside process knowledge and equipment operation

as is relevant to the practical operation of equipment at that job level.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined

EVIDENCE GUIDE	
	• appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i> The person undertaking this competency is expected to be able to work under and manage situations of high pressure, in order to ensure the safe and efficient management of the control room production process and the safety of plant employees.
Guidance information for assessment	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
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.

RANGE STATEMENT	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Causes of shutdown may be: - planned, eg for maintenance or other planned work - unplanned, eg in response to a plant upset or equipment failure - emergency, eg in response to an automatic shutdown sequence or plant trip. The shutdown may be: - shutdown 'to cold', eg complete plant shutdown and purging of all process materials from equipment - short shutdown to allow minor work 'warm shutdown', eg partial shutdown, with retention of some or all of process materials - managing a plant trip and restart 'hot shutdown', eg short duration shutdown in response to a plant upset or trip This competency also includes: - coordinating the shift team - implementing emergency procedures - using the permit to work system (for repairs required). - This competency may apply to: - panel technicians - outside technicians - technicians seconded to a shut down role - other relevant personnel All operations are performed according to procedures.
Appropriate action	Appropriate action includes: - determining problems needing action - determining possible fault causes - rectifying problem using appropriate solution within area of responsibility - following through items initiated until final resolution has occurred - reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: - all work instructions - standard operating procedures - formulas/recipes

RANGE STATEMENT

	• batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS433A Manage wells and gathering systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge needed by a senior field operator, or similar person, who manages a group of wells and gathering systems. The management is of the technical aspects of well/system operation, and while this person may also manage well operating personnel that is not part of this competency. It includes operating individual wells so as to optimise the output from all wells being managed.

Application of the Unit

Application of the unit	This unit of competency applies to senior operators, field technicians or people of similar responsibility who are responsible for a number of wells and their associated systems. In a typical scenario, the senior operator will examine data from a group of wells and then make/recommend changes so as to optimise the output of the group of wells and/or to better match their output to the requirements of the organisation for that group of wells. They would also be expected to undertake investigations and to solve well and operating problems which are beyond the ability of the well operator. This competency is typically performed by senior operators working independently while in communication with field operators, plant operators and production management with whom they would work as part of a team. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel 1.4. Determine appropriate schedule and priorities for work
2. Operate site, well/ system and equipment	2.1. Complete site checks 2.2. Use well control systems 2.3. Take required readings 2.4. Operate plant

ELEMENT	PERFORMANCE CRITERIA
	2.5. Start up/shut down well/system 2.6. Isolate/de-isolate an item of, or an entire well/system
3. Optimise wells and gathering systems	3.1. Analyse network 3.2. Interpret network communication 3.3. Determine processing plant requirements and the impact of this on well and system operation 3.4. Investigate status of individual wells 3.5. Advise well operator of needed adjustments 3.6. Recommend well stimulation or other required action 3.7. Ensure flows from wells and systems meet plant and organisation needs 3.8. Complete logs and reports as required
4. Prioritise and organise work	4.1. Ensure required maintenance work has been requested 4.2. Prioritise maintenance work in liaison with appropriate personnel 4.3. Organise well shutdowns to suit production requirements where practical 4.4. Coordinate field operators to ensure their work and priorities match plant and organisation requirements
5. Solve problems	5.1. Provide guidance to operators for shutdown/startup as required 5.2. Develop the technical problem solving capability of well operators 5.3. Analyse data from wells and systems to identify systemic or recurring problems 5.4. Take appropriate action to solve problems
6. Finalise shift activities	6.1. Complete shift tasks as appropriate 6.2. Ensure identified faults are correctly logged/reported for action 6.3. Ensure incomplete tasks are scheduled for follow up 6.4. Ensure all logs and reporting are complete and understood 6.5. Check operators have completed required tasks

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- mathematics to the level of calculating volumetric flow rates and other process/equipment conditions (e.g. efficiency)
- problem recognition and solving

Required knowledge

Required knowledge, to the breadth and depth required for the operation of the well and gathering systems includes:

- oil/gas formation, structure and completions for coal seam gas (CSG), traditional or other oil/gas formations
- coal type and structure or other bedrock structures
- well design and construction
- hydrate formation
- free flow and pumped wells
- pumping principles
- gas flow principles
- gas/water separation principles
- draining and venting requirements
- typical issues causing problems and the resolution of those problems
- lease requirements
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- static electricity and earthing
- corrosion control and chemical handling and material safety data sheets (MSDS)
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions

REQUIRED SKILLS AND KNOWLEDGE

- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, problem solving of each
- physics and chemistry relevant to each unit and the processes used
- flange pressure and temperature ratings (basic)
- cathodic protection (basic)
- relevant environmental and heritage requirements
- protective systems
- control systems
- remote terminal unit, functions, operation and problems
- downhole drawings (DHDs) and their application to plant/well operation
- mathematical formulae and their application to well flow rates and plant operation/efficiency
- pump, drivehead, fuel gas systems operations and principles
- fluid dynamics and statics as relevant to the system
- natural gas and oil characteristics as applicable
- reservoir management
- environmental aspects and conditions

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

This unit of competency requires an application of the knowledge contained in the use of the equipment, to the level needed to maintain control and recognise and resolve problems.

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

Assessment for this unit of competency will be on a plant.

It is essential that the equipment be understood and that the importance of critical material properties, settings and readings is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

The emphasis should be on the ability to stay out of

EVIDENCE GUIDE	
	trouble rather than recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment processes needing attention or with potential problems are recognised • the range of possible causes can be identified, analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant/system areas are recognised and an appropriate contribution made to their solution. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.
Context of and specific resources for assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training. A bank of scenarios/case studies/what-ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Individual enterprises may choose to add prerequisites

EVIDENCE GUIDE	
	and co-requisites relevant to their processes.
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

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	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations All work will comply with procedures
Site	Site may be: • a well • a nominated area in the gathering system • another location where the operator is required

RANGE STATEMENT	
	to work
Equipment	Typical items of plant and equipment included in this unit of competency are: • wellheads • choke and control valves • meters • flow lines • high point vents • low point drains • valves including non-return and pressure/vacuum relief • pumps and their prime movers • product separation units • instrumentation and control systems (variable speed drive (VSD) and proportional, integral derivative (PID)) • testing equipment • power units • drive heads • flares
Equipment condition and operation checks and adjustments	Equipment condition and operation checks and adjustments may include: • chemical injection equipment • storage tanks • pumps and pump speed • autodumps • drains and drain points • vents and high points • leaks • other items • valve operation • strainers (pump, line or other) • drive head power units, belt tension and hydraulic oil levels • fuel gas system/desiccant • field flares • corrosion control system/cathodic protection • control/float valves
Levels	Levels may include:

RANGE STATEMENT	
	• chemical storage levels • lubricating oil levels • water and gas levels • battery levels • drain levels • other levels
Interwell communications	Interwell communications include: • pressure • flow • other technical parameters
Well status	Well status includes interpreting data from: • well flows • flow rates, pressure and temperature • downhole conditions and information
Required calculations	Required calculations may include: • production figures • comparison of figures to targets • equipment efficiencies
Logs and reports	Logs and reports may be paper or electronic based and may also include verbal/radio reports Reports include reporting items found which require action
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person
Lease maintenance areas requiring action	Lease maintenance areas requiring action may include: • land erosion • fence and gate integrity

RANGE STATEMENT	
	• weeds and other growth • actions of feral or other fauna • other required items
Identified faults	Identified faults may include: • instrumentation failure/malfunction • electrical failure/malfunction • mechanical failure/malfunction • control system failure/malfunction • mismatch between flow rates and system requirements • wear, tear and corrosion of plant and equipment • quality measurement inaccuracy (e.g. analyser or sampling deficiency)
Typical problems	Typical problems may include: • leakage • solids (formation fines) • vibration • loss of control of pressure and/or flow • hydrate formation and blockages • liquid slugging • corrosion • erosion • sulphate reducing bacteria • scale formation • equipment failure • change in product parameters (e.g. temperature, flow, pressure, and level) • fouling or contamination
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state, territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS434A Commission wells and gathering systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge needed by a senior operator, or similar person, to commission wells and gathering systems. The commissioning would be operational commissioning and would take place after pre-commissioning of equipment and systems had occurred (typically performed by a contractor or projects team). On conclusion the well and gathering system should be operational within desired limits and be able to be handed over to a field operator for normal operation.

Application of the Unit

Application of the unit	This unit of competency applies to senior operators, field technicians or people of similar responsibility who are responsible for the commissioning of a well, its gathering system and their associated systems. In a typical scenario, the senior operator will bring a new (or worked over/rejuvenated) well and its gathering system on line and make adjustments to ensure it is in steady operation and delivering at the required rate. They will also balance the impact of the new well on the entire system providing feed to the plant to ensure the plant receives a stable feed at the required quality and rate. This competency is typically performed by senior operators working independently while in communication with operators, panel operator and the senior operator with responsibility for managing the group of wells of which the well being commissioned forms a part. This unit of competency has a narrower focus than <i>PMAOPS433A Manage wells and gathering systems</i> as the focus is on

	one well at a time, rather than optimising the entire group of operational wells. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel

ELEMENT	PERFORMANCE CRITERIA
	1.4.Determine appropriate schedule and priorities for work
2. Accept handover of well and gathering system	2.1.Ensure documents and other records provided match 'as is' plant and equipment 2.2.Check all issues have been satisfactorily resolved 2.3.Confirm status of individual items being handed over 2.4.Ensure plant and equipment are operationally sound as appropriate 2.5.Accept handover when appropriate 2.6.Complete logs and reports as required
3. Commission well	3.1.Commission support systems 3.2.Commission wellhead and components as required 3.3.Make appropriate adjustments to bring well to stable operation
4. Commission gathering system	4.1.Commission support systems 4.2.Introduce product to gathering system 4.3.Check all equipment is operating correctly 4.4.Take appropriate action to solve problems
5. Monitor and adjust well and gathering system	5.1.Take required readings 5.2.Ensure telemetry and controls are functional as required 5.3.Balance well and gathering system 5.4.Adjust downhole pump speed to maintain correct liquid level 5.5.Monitor nearby wells for impact of new well 5.6.Complete site checks 5.7.Take required readings 5.8.Liaise with relevant operational personnel as required 5.9.Make appropriate adjustments to ensure new well is performing as required
6. Finalise commissioning activities	6.1.Complete commissioning tasks as appropriate 6.2.Ensure identified faults are correctly logged/reported for action 6.3.Ensure incomplete tasks are scheduled for follow up 6.4.Ensure all logs and reporting are complete and understood 6.5.Check all systems are operational and all relevant

ELEMENT	PERFORMANCE CRITERIA
	personnel are informed

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- mathematics to the level of calculating volumetric flow rates and other process/equipment conditions (e.g. efficiency)
- problem recognition and solving

Required knowledge

Required knowledge includes:

- oil/gas formation, structure and completions for coal seam gas (CSG), traditional or other oil/gas formations
- coal type and structure or other bedrock structures
- well design and construction
- hydrate formation
- free flow and pumped wells
- pumping principles
- gas flow principles
- gas/water separation principles
- draining and venting requirements
- typical issues causing problems and the resolution of those problems
- lease requirements
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- static electricity and earthing

REQUIRED SKILLS AND KNOWLEDGE

- corrosion control and chemical handling and material safety data sheets (MSDS)
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function/principles of operation, problem solving of each
- physics and chemistry relevant to each unit and the processes used
- flange pressure and temperature ratings (basic)
- cathodic protection (basic)
- relevant environmental and heritage requirements
- protective systems
- control systems
- remote terminal unit, functions, operation and problems
- downhole drawings (DHDs) and their application to plant/well operation
- mathematical formulae and their application to well flow rates and plant operation/efficiency
- pump, drivehead, fuel gas systems operations and principles
- fluid dynamics and statics as relevant to the system
- natural gas and oil characteristics as applicable
- reservoir management
- environmental aspects and conditions

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

This unit of competency requires an application of the knowledge contained in the use of the equipment, to the level needed to maintain control and recognise and resolve problems.

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

Assessment for this unit of competency will be on a plant.

It is essential that the equipment be understood and that the importance of critical material properties, settings

EVIDENCE GUIDE

	and readings is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment processes needing attention or with potential problems are recognised • the range of possible causes can be identified, analysed and the most likely cause determined • appropriate action is taken to ensure a correctly operating well and gathering system • obvious problems in wells are recognised and an appropriate contribution made to their solution. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.
Context of and specific resources for assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training. A bank of scenarios/case studies/what-ifs and questions will be required to probe the reasoning behind observable actions.

EVIDENCE GUIDE	
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.
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

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	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations All work will comply with procedures

RANGE STATEMENT	
Site	Site may be: • a well • a nominated area in the gathering system • another location where the operator is required to work
Equipment	Typical items of plant and equipment included in this unit of competency are: • wellheads • flow lines • high point vents • low point drains • valves including non-return and pressure/vacuum relief • pumps and their prime movers • product separation units • instrumentation and control systems (variable speed drive (VSD) and proportional integral derivative (PID)) • testing equipment • power units • drive heads • flares
Equipment condition and operation checks and adjustments	Equipment condition and operation checks and adjustments may include: • chemical injection equipment • field flares • storage tanks • pumps and pump speed • autodumps • drains and drain points • vents and high points • leaks • other items • valve operation • strainers (pump, line or other) • drive head power units, belt tension and hydraulic oil levels • fuel gas system/desiccant • corrosion control system/cathodic protection

RANGE STATEMENT	
	• control/float valves
Support systems and equipment	Support systems and equipment may include: • fuel gas • lubricating oil • check valves • control valves • remote terminal unit • telemetry (communications to base) • control systems • distributed control systems (DCS) screens • other systems and equipment
Product quality	Product quality may include: • product delivery variables, such as pressure • product delivery rate (flow rate) • moisture/water content • contamination • other items
Levels	Levels may include: • chemical storage levels • lubricating oil levels • water and gas levels • battery levels • drain levels • other levels
Interwell communications	Interwell communications include: • pressure • flow • other technical parameters
Well status	Well status includes interpreting data from: • well flows • flow rates, pressure and temperature • downhole conditions and information
Required calculations	Required calculations may include: • production figures • comparison of figures to targets • equipment efficiencies

RANGE STATEMENT	
Logs and reports	Logs and reports may be paper or electronic based and may also include verbal/radio reports Reports include reporting items found which require action
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person
Identified faults	Identified faults may include: • instrumentation failure/malfunction • electrical failure/malfunction • mechanical failure/malfunction • control system failure/malfunction • mismatch between flow rates and system requirements • wear, tear and corrosion of plant and equipment • quality measurement inaccuracy (e.g. analyser or sampling deficiency)
Typical problems	Typical problems may include: • leakage • solids (formation fines) • vibration • loss of control of pressure and/or flow • hydrate formation and blockages • liquid slugging • corrosion • erosion • sulphate reducing bacteria • scale formation • equipment failure • change in product parameters (e.g.

RANGE STATEMENT	
	temperature, flow, pressure and level) fouling or contamination
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state, territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS450B Solve colour problems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit applies a knowledge of colour to solving colour problems both for external customers and in the plant (ie colour is/appears to be wrong).

Application of the Unit

Application of the unit	In a typical scenario, a technician receives a complaint arising from either an external customer or an internal customer, such as a production manager or team leader. The complaint concerns colour which is not as the complainant expected it to be. The technician gathers the appropriate data, then makes an analysis as to the cause of the problem and makes recommendations as to how this problem might be rectified. The complaints may include: • the colour as made does not match the standard • the colour as provided does not match the standard • the colour initially appeared correct, but is now unsatisfactory. The technician would: • clarify the problem • analyse problem cause(s) • recommend a solution to the problem. Generally the technician would work alone for this unit, although the ability to communicate with all internal and external customers and stakeholders (simply referred to as 'customers') is vital.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Assist customer to articulate problem.	1.1. Clarify customer perception of problem 1.2. Assess opportunities for a targeted response to meet customer needs 1.3. Identify the rights and responsibilities of the customer and effectively communicate these to the customer 1.4. Clarify the history of the problem 1.5. Define problem and complete records.
2. Analyse possible problem cause(s).	2.1. Examine the colour of the object/surface and: 2.2. compare to standard to determine if colour faulty 2.3. determine potential causes if colour faulty 2.4. Analyse history of problem for potential causes 2.5. Question customer to clarify issues revealed by examination 2.6. Take samples and arrange for tests as appropriate 2.7. Determine range of possible causes consistent with data available 2.8. Determine most likely cause(s) of defined and observed

ELEMENT	PERFORMANCE CRITERIA
	problem.
3. Satisfy customer needs.	3.1.Determine appropriate strategies and activities to resolve problem 3.2.Negotiate proposed solution with customers and other relevant parties 3.3.Identify potential areas of difficulty in customer service delivery and take appropriate actions to address them 3.4.Follow items initiated through until final resolution has occurred 3.5.Meet customer needs within the scope of area of responsibility 3.6.Report problems outside area of responsibility to designated person 3.7.Follow procedures where a decision is made to terminate a service 3.8.Complete reports to procedure.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

This competency requires the following skills:

- communication
- interrogation
- observation
- analysis

Required knowledge

Competence includes an understanding of colour and the interaction of colour components during processing and in application. A knowledge of the impact of weathering/aging on colour as appropriate to the product is also required. In particular it includes the ability to:

- distinguish between colour variations caused by materials or processing errors
- distinguish between colour variations caused by faulty surface preparation or application
- interrogate customers to obtain all relevant information, but in a manner which is pleasing to the customer

REQUIRED SKILLS AND KNOWLEDGE

- explain the causes of colour variation in a manner which will be understood and accepted by the customer
- describe the causes and remedies of common problems such as those selected in the Range Statement.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be using real or simulated colour problems. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include a range of colours, problem causes and environments.

Simulation may be used for assessment of this unit of competency. Simulation should be based on the actual colour problems and should include the use of case studies/ scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what if scenarios.

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

Competence must be demonstrated in the ability to define and analyse the problem as well as deal with the customer. The customer should be satisfied with the solution, as well as the solution being technically sound.

Consistent performance should be demonstrated. In particular look to see that:

- different types of problems can be analysed and resolved
- different types of customers can be satisfied
- the range of possible causes can be identified and analysed and the most likely cause determined

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	• appropriate action is taken. These aspects may be best assessed using a range of scenarios/case studies/what-ifs. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past history and similar sources.
Context of and specific resources for assessment	Assessment will require a suitable method of gathering evidence of colour problem solving ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes colour problems both in the plant and within the customer site (ie it includes both internal and external customers). This may include (select relevant items): • batches during manufacture do not conform to colour specification • colour as supplied to customer does not conform

RANGE STATEMENT	
	• colour as applied to substrate does not conform • colour variation within the product • colour was initially satisfactory but has changed over time • other colour problem. Typical problem causes may include: • wrong colourant • wrong colourant amount • incorrect processing/mixing/dispersing • incorrect substrate preparation (eg of painted/printed surface) • incorrect application (eg of paint/ink) • incorrect colour measurement and testing • defect standard • process changes and variations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS460A Monitor and operate tailings management facilities

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to monitor tailings disposal sites, identify and manage risks (business and environmental), and respond to threats to tailings site integrity.

Application of the Unit

This unit applies to a person who has the responsibility for deposition of tailings from early stage metalliferous beneficiation processes and monitoring and operating tailings management facilities for the duration of a facility's life. The work may involve assessing risks associated with a tailings management facility, operating equipment to deposit tailings in the tailings management facility, taking measurements and making observations on the integrity of the facility, and taking actions to prevent or ameliorate adverse environmental outcomes from the tailings management facility. The type of people to whom this unit may apply include (but are not limited to):

- environmental officer
- process worker
- operator
- inspection and monitoring officer.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

Where sampling and testing is part of this job, *MSAPMSUP292A Sample and test materials and product* may also be relevant.

Where operating a vehicle is part of the job, *PMASUP236B Operate vehicles in the field* may also be relevant

This unit requires a detailed knowledge about the characteristics of the tailings (particularly as they occur in regard to the facility being managed), the design of the tailings management facility, methods of tailings disposal and deposition and associated equipment, water balance issues and environmental risks. Understanding of related processes and plant that produces tailings would be beneficial.

This unit has been written with a focus on early stage metal beneficiation processes in mind, particularly in regard to processes associated with aluminium, iron, gold, copper, tin, silver, lead and zinc. Tailings management facilities may have deposited material suspended in varying levels of water ranging from slurry (e.g. 'red mud'), through high slump pastes (e.g. filter cake) to low slump pastes, but the focus has been on sub-aerial deposition (not subaqueous or sea deposition). While not specifically considered, the unit should also be applicable to other types of waste that might be deposited in a tailings management facility, including overburden and possibly slag or other solid waste products from later metalliferous processes with appropriate contextualisation.

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control work health and safety (WHS) hazards and identify risks to the environment

		1.3	Coordinate with appropriate personnel, including facility managers and team members
		1.4	Check for recent work undertaken on facility
		1.5	Note any outstanding/incomplete work
		1.6	Check operational status of ancillary/feed equipment
		1.7	Complete any required pre-start checks, including an assessment of process production levels, and therefore likely tailings production levels
2	Operate equipment for tailings deposition	2.1	Access and interpret process waste/tailings management plan and comply with documented processes
		2.2	Identify the type of facility equipment and assess the appropriateness of the equipment given the tailings physical characteristics
		2.3	Start up and shut down deposition equipment according to the tailings management plan and equipment type and duty
		2.4	Measure and report on rate of flow, tailings characteristics and deposition outcomes, as required
		2.5	Set plant to deliver tailings to appropriate location of discharge point according to tailings management plan
		2.6	Complete routine checks, logs and paperwork, taking appropriate action on unexpected readings and trends
		2.7	Discharge tailings, as appropriate, based on set rotation sequence for discharges ('paddocks') and duration of deposition
3	Monitor and control tailings management facility	3.1	Carry out routine plant and facility inspections
		3.2	Record observations
		3.3	Collect samples and conduct and analyse tests, as required
		3.4	Calculate operational performance against standards established in the tailings management plan

		3.5	Report operational condition of the tailings management facility
4	Recognise problems and take appropriate action	4.1	Recognise developing situations which may require action
		4.2	Calculate water balance, as required
		4.3	Adjust inflows and outflows (e.g. decant rate and tailings inflow) appropriately to respond to potential water imbalance especially overflows
		4.4	Identify problems arising from dust generated in tailings management facilities
		4.5	Respond to dust problems, as appropriate
		4.6	Apply 'mud farming' where dusting (for instance in arid, low rainfall regions) is prevalent to keep the surface moist
		4.7	Report any issues identified with the integrity of the equipment delivering tailings to the management facility
		4.8	Apply the requirements of the Emergency Management Plan in case of significant breaches of tailings management facility integrity (for instance a breach of dam wall)
5	Isolate and de-isolate facility	5.1	Isolate equipment
		5.2	Make safe for required work
		5.3	Check is ready to be returned to service
		5.4	Prepare for return to service

Required Skills and Knowledge

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

Required skills

Required skills include:

- conducting a range of tests to measure tailings management facility performance, including for water quality, dam wall movement, water pressure and water flow
- interpreting outcome measures from tests performed
- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures against the waste/tailings management plan within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- using communication technology
- driving vehicles in remote settings with limited support, as required
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents, calculate various indices and interpret technical information
- applying mathematics to the level of year 10

Required knowledge

Required knowledge, to the breadth and depth required for the operation of the tailings management facility, includes:

- principles of operation of pumps under conditions of different tailings consistency and water percentage
- principles of operation of conveyor belts under conditions of different tailings consistency and water percentage
- process parameters and limits of tailings disposal plant (e.g. pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems (plant/equipment, process, environmental) and the resolution of those problems
- relevant alarms and actions
- physics and chemistry relevant to the tailings being managed and their chemical, physical, handling and placement characteristics
- relevant environmental and heritage requirements
- mathematical formulae and their application to waste management calculations, as needed

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

Critical aspects for assessment and evidence are:

- work requirements are identified
- appropriate routine checks, logs and paperwork are completed and appropriate action planned, as required
- routine plant and facility inspections are properly carried out
- problems are identified and responses planned
- work environment and equipment are made safe for use.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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

Procedures may be written, verbal, computer-based or in some other form. They may include, but are not

limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- positioning of the decant pond, damp or seepage at the dam wall, status of leak detection systems, any unusual vegetation or wildlife occurrences, tailings surface status, and integrity of the dam wall
- recording piezometer readings on water pressure, groundwater quality, seepage and leakage rates through notch weirs, settlement and displacement survey measurements of dam walls
- calculating water balance based on measures of inflow (with tailings, rainfall, catchment run-off, and so on), storage and outflow (seepage, water reclaim, evaporation, and so on)
- responding to dust issues by spraying with chemical dust suppressants, covering the tailings with gravel, setting up silt trap fences or changing the tailings water ratio to maximise the wetted surface
- determining problems needing action
- accessing and applying relevant technical and plant data
- applying appropriate problem solving techniques to determine possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred

- reporting problems outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- rupture of the tailings slurry delivery pipeline or decant water return pipeline
- rainfall induced erosion of the tailings facility containment wall or water imbalance
- geotechnical failure/excessive deformation of containment wall
- overfilling with tailings beyond management facility capacity, especially the result of unpredicted tailings production
- seepage of hazardous materials through the dam wall or through the foundation into the groundwater
- dust emissions especially of toxic materials
- uncontained floodwater in high rainfall areas

Tailings/waste characteristics

Tailings/waste characteristics include:

- mineralogy: residual resource potential, and plant nutrients
- chemical reactivity: toxicity, leachate potential, acid producing potential, spontaneous combustion, cementation/hydration and weathering
- physical characteristics: particle size distribution, particle density compressibility, shear strength, liquefaction potential, erodibility and dusting potential
- placement characteristics: placed dry density, particle sorting, permeability, bearing capacity and initial placement density
- handling characteristics: solids content of slurries, trafficability during placement, flocculation/settling time and abrasiveness

Tailings disposal strategy

Tailings disposal strategy can include:

- use/operating of equipment, such as pipes, pumps, conveyor belts, pipeline delivering tailings to management facility (leaks, blockages) and associated equipment (for instance centrifugal or positive displacement pumps)
- the location of discharge points
- the rotation sequence for discharges
- the duration of deposition in an area
- the location of settling ponds and decant facilities

- the location and timing of intermediate paddock bunding
- the likely landform created by the deposition processes at stages throughout operations up to and including final landform
- flowable volumes and potential flow paths
- operational maintenance requirements (e.g. dust suppression, fauna exclusion and drainage)

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Work requirements

Work requirements may come from briefings, handovers and work orders and may include:

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions
- geological data
- site survey data
- site layout and out of bounds areas
- worksite inspection requirements
- lighting conditions
- plant or equipment defects
- hazards and potential hazards
- coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS500A Optimise production systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the application of in depth knowledge of process and plant to the optimisation of complex operating production systems.

Application of the Unit

Application of the unit	In a typical scenario, a senior technician reviews the operation of a complex production system or whole production plant, with a view to improving the efficiency of operation of the process to improve the yield, utilization of services or production of waste. The operation will be thoroughly reviewed by gathering data on usage patterns, production rates, operational practices and conditions with a view to determining areas of improvements or possible gains in efficiency or reductions in variability. Optimization is often a multi-pass process whereby the process is modified, reviewed and modified again as required. The stimulus for optimization is usually not in response to a problem, but a desire to improve the performance of an operating process. The corrective action may well be beyond the scope of competency and responsibility of the senior technician to implement. Typical systems optimisations may include: • utilisation of services across a production facility • variability of product properties produced from a multi-line batch reaction process • variability of plant performance from shift to shift, day to day, week to week The senior technician would: • gather historical plant operating or product quality data • review the data for trends or dependencies • investigate cause and effect responses • recommend a solution to the problem. Generally the technician would work alone for this unit, although the ability to communicate with all internal and external stakeholders is vital.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify process or system for review.	1.1. Review process or plant performance to determine likely areas of improvement. 1.2. Gather data on the process or system design 1.3. Design the data collection system for the required data.
2. Collect and analyse data.	2.1. Collect or review available data from the process or plant 2.2. Analyse the data for trends or dependencies 2.3. Postulate possible cause and effect scenarios
3. Develop tests or trials.	3.1. Propose controlled tests or trials to review the plant or process patterns

ELEMENT	PERFORMANCE CRITERIA
	3.2. Discuss possible solutions to cause with relevant people 3.3. Arrange for required tests or controls to be undertaken in appropriate time frame 3.4. Collect further data from tests or trials 3.5. Review plant or process data and compare with original data. 3.6. Prepare further tests or trials as required, or until possible solutions are developed.
4. Develop improvement solution	4.1. Agree required improvement solution with appropriate people 4.2. Arrange for required improvement solution to be undertaken in appropriate time frame 4.3. Follow items initiated through until final resolution has occurred 4.4. Check effectiveness of solution and take appropriate action 4.5. Complete reports to procedure.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
This unit requires skills of: • data collection and analysis • problem solving for multi-variable processes • negotiation • communication • basic mathematics
Required knowledge
Competence includes a deep understanding of: • plant equipment, its characteristics and limitations • impact of variations in plant/process and the distinctive signs of each variation • process chemistry, physics and biochemistry as relevant (eg to the extent of writing chemical equations and identifying factors controlling reaction rate and yield or

REQUIRED SKILLS AND KNOWLEDGE

- equivalent, or determining mass or heat transfer rates for a process)
- problem isolation techniques
 - problem analysis techniques
 - organisation approval 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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include a range of problems, problem causes and environments.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual problems and should include the use of case studies/ scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios.

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

Competence must be demonstrated in the ability to define and analyse the problem as well as deal with the stakeholders. The stakeholders should be satisfied with the solution, as well as the solution being technically sound.

Consistent performance should be demonstrated. In particular look to see that:

- different types of processes or plant units can be analysed and resolved
- different types of stakeholders can be satisfied
- the range of possible causes can be identified and

EVIDENCE GUIDE	
	analysed and the most likely cause determined • appropriate action is taken. These aspects may be best assessed using a range of scenarios/case studies/what-ifs. These assessment activities should include a range of optimisation projects which may have been generated from the past history and similar sources.
Context of and specific resources for assessment	Assessment will require a suitable method of gathering evidence of problem solving ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes reviews of the plant, plant equipment or process which may make itself evident through desire for improved quality, higher yields, less waste or better control.
Health, safety	All operations to which this unit applies are subject to stringent health,

RANGE STATEMENT**and
environment
(HSE)**

safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS501A Provide operational expertise to a project team

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the application of in depth knowledge of process and plant to the formulation, running and completion of a project for a new facility or expansion. The senior technician provides operational experience and advice to all facets of the project.

Application of the Unit

Application of the unit	In a typical scenario, a senior technician provides operational expertise to a project team, for a new facility, expansion or other major works. Project teams usually comprise engineers with various technical specialisations (eg process, mechanical, electrical, control,) and project managers. The provision of operations expertise to a project team provides a critical, practical link to the operational requirements of the planned works. The senior technician may provide expertise in the following areas: • initial scoping of the project, in terms of operational manning, control and operation requirements, practicality of operational design • operational safety reviews of the design process (eg HAZOP, HAZAN or similar review processes) • design reviews for operability considerations • review of instrument and control layouts, sequences and screens • preparation of operator training materials • preparation of operation procedures. Generally the senior technician would work as part of the project team and thus the ability to communicate with all internal and external stakeholders is vital.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify operational requirements for the project.	1.1. Review initial design specifications for project 1.2. Analyse proposed operational requirements, including operational requirements, manning levels and expertise required for the proposed works. 1.3. Document operation review as required.
2. Review design.	2.1. Review design for operational safety of proposed works. 2.2. Contribute to systematic safety review process as required. 2.3. Review instrumentation and controls for operability. 2.4. Review control sequences and control screen layouts for operability considerations. 2.5. Document operability reviews of design as required
3. Develop procedures and training	3.1. Develop procedures for commissioning and/or operations 3.2. Develop training materials for operators based on design

ELEMENT	PERFORMANCE CRITERIA
	information 3.3. Review operator training and procedures with project design team as required 3.4. Document procedures, training and reviews as required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

This unit requires skills of:

- plant operations
- interpretation of designs, schematics and specifications
- negotiation
- communication, face to face, written instructions, reports
- basic mathematics

Required knowledge

Competence includes a deep understanding of:

- plant equipment, its characteristics and limitations
- impact of variations in plant/process and the distinctive signs of each variation
- process chemistry, physics and biochemistry as relevant
- operational requirements for equipment and processes
- organisational operating procedures and training materials
- safety review procedures and techniques (eg HAZOP)

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, the Range Statement and the Assessment Guidelines for the Training Package.

EVIDENCE GUIDE	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include a range of problems, problem causes and environments. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual problems and should include the use of case studies/ scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to define and analyse the problem as well as deal with the stakeholders. The stakeholders should be satisfied with the solution, as well as the solution being technically sound. Consistent performance should be demonstrated. In particular look to see that: - operational expertise can be applied across the planning, design and review stages of a project - different types of stakeholders can be satisfied (operations, technical and project management) - review and materials are appropriately documented - appropriate action is taken. These aspects may be best assessed using a range of scenarios/case studies/what-ifs. These assessment activities should include a range of design projects which may have been generated from the past history and similar sources.
Context of and specific resources for assessment	Assessment will require a suitable method of gathering evidence of problem solving ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

EVIDENCE GUIDE	
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes provision of operational expertise and advice to a project team involved in designing a new plant or modifications to a facility.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS505A Control the process during abnormal situations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the responses required by a senior technician to make decisions and control a process during abnormal or declared incident situations to prevent or avoid an emergency.

Application of the Unit

Application of the unit	In a typical scenario, a senior technician takes control of the process and makes decisions in order to manage an abnormal situation. This could be in response to a declared situation or the plant condition leading to an emergency situation. The senior technician would operate from the control center or panel and may have an Emergency Shutdown (ESD) capability available. The senior technician will be part of a team and would be expected to lead the team and direct others to respond to the situation appropriately, with a view to recovery of the situation and restoring the plant/process to a stable condition. The technician would: • clarify the situation • prioritise the responses and actions • organise and direct the operations team • review the situation and respond to any changes • communicate with all relevant personnel. Generally the senior technician would work as part of an operations team for this unit, the ability to communicate with all internal and external stakeholders is vital.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify the abnormal situation	1.1. Identify the state of the plant/process 1.2. Gather available information on the plant/process with particular focus on trends and rates of change 1.3. Verify and confirm situation with other technicians in the area and any upstream or downstream units.
2. Respond appropriately.	2.1. Apply immediate actions to respond to the abnormal situation to bring the plant/process to a safer state 2.2. Decide whether to continue operations, shutdown or abandon 2.3. Keep in contact with other technicians in the area
3. Review and respond to changes.	3.1. Review the situation, gather data on the state of the plant/process and the trends and rates of change 3.2. Make appropriate changes to the state of the plant/process to keep parameters within limits 3.3. Rectify or initiate procedures to rectify any faults or adjustments to secure the safe operation of the plant/process 3.4. Review the state of the recovery, making adjustments as

ELEMENT	PERFORMANCE CRITERIA
	required 3.5. Keep all other stakeholders informed of progress 3.6. When plant is restored to stable conditions, continue to monitor the situation.
4. Document abnormal situation and response.	4.1. Complete all logs and workplace documentation relating to the abnormal situation, ensuring all details, actions and responses are accurately recorded 4.2. Record any further ongoing production problems and report to appropriate persons or authority.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

This unit requires skills of:

- analysis of rapidly changing and possibly confusing data
- problem solving
- communication under stress
- leadership of the operational team

Required knowledge

Competence includes a deep understanding of:

- plant equipment, its characteristics and limitations
- impact of variations in plant/process and the distinctive signs of each variation
- process chemistry, physics and biochemistry as relevant
- problem isolation techniques
- problem analysis techniques
- organisation approval processes

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in

EVIDENCE GUIDE	
conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include a range of problems, problem causes and environments. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual problems and should include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to define and analyse the problem as well as deal with the stakeholders. The stakeholders should be satisfied with the solution, as well as the solution being technically sound. Consistent performance should be demonstrated. In particular look to see that: • different types of abnormal situations can be analysed and resolved • different types of stakeholders can be satisfied • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken. These aspects may be best assessed using a range of scenarios/case studies/what-ifs. These assessment activities should include a range of abnormal situations, including new, unusual and improbable situations which may have been generated from the past history and similar sources.
Context of and specific resources for assessment	Assessment will require a suitable method of gathering evidence of problem solving ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of

EVIDENCE GUIDE	
	questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes abnormal situations, declared situations or emergency conditions in the plant or process, where recovery of the situation is possible.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS511B Determine energy transfer loads

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the application of a knowledge of energy transfer and energy balance principles to the design and use of processing equipment.

Application of the Unit

Application of the unit	In a typical scenario, the heat transfer loads for process equipment is required to be determined. Calculations are performed to determine the heat transfer loads, to help in the diagnosis of plant performance problems, to identify heat losses or for the specification of new or modified equipment. This competency is typically performed by senior technicians. It includes: • conduction, convection and radiation • thermal properties of materials, particularly process materials • methods of heating process materials • cooling systems • energy balances.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Calculate heat transferred from/to items.	2.1. Calculate conductive heat transfer to/from an object 2.2. Calculate convective heat transfer to/from an object 2.3. Calculate radiative heat transfer to/from an object 2.4. Calculate combined heat transfer to/from an object, including resistances in series and parallel.
3. Calculate temperature change	3.1. Calculate temperature change caused by heating/cooling of process materials in typical examples of processing equipment 3.2. Calculate change in heat content caused by chemical reaction 3.3. Calculate temperature rise caused by chemical reaction.
4. Select appropriate heating and/or cooling mechanism for an application.	4.1. Compare rates of heat transfer/overall heat transfer coefficients for major methods of heating and cooling 4.2. Determine appropriate methods of varying/controlling rates of heat transfer 4.3. Calculate heat transfer rates under a range of conditions.
5. Conduct energy balance over	5.1. Determine desired boundaries for energy balance

ELEMENT	PERFORMANCE CRITERIA
process components.	calculation 5.2.Determine possible sources of data required from the plant 5.3.Match and adjust sources of data to desired boundary for energy balance 5.4.Determine overall heating load 5.5.Determine overall cooling load 5.6.Determine the adequacy (or otherwise) of the process/plant heating/cooling system to cope with this load.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to:

- determine the boundaries of the system to be studied
- collect the required plant data from measurements, readings or calculated quantities
- calculate the energy transfer loads
- report the results.

Competence also includes the ability, for the practical completion of the job, to apply and/or explain:

- conduction
- convection
- radiation
- combined conduction/convection
- specific heat capacity
- exothermic and endothermic reaction calculations
- energy balances.

Required knowledge

Knowledge and understanding of heat transfer principles and calculations sufficient to determine the heating/cooling loads of an existing or a new 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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

This unit may be appropriately assessed using a special project based on an actual plant. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant and off the plant.

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

Competence must be demonstrated in the ability to complete an energy balance in a structured way, taking real data from an operating plant.

Consistent performance should be demonstrated. In particular look to see that:

- realistic boundaries are drawn for the energy balance which align with practical sources of data from the plant
- data is collected from the plant with minimum disruption to production
- theoretical and practical requirements for the energy balance are consistent
- the energy balance data is used to identify and contribute to solutions for plant problems.

This will typically be assessed by one or more energy balance projects on an operating plant. One complex energy balance, or a number of simple energy balances, are required to demonstrate competence.

Context of and specific resources for assessment

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of

EVIDENCE GUIDE	
	questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	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 heating/cooling loads of all processing equipment and requires the quantitative determination of loads. This competency applies to all sectors within the chemical, hydrocarbons and oil refining industry. Heat transfer modes include: • conduction • convection (forced and natural) • radiation • combined conduction/convection. Sources of heating/cooling include: • chemical reaction • water cooling • air cooling • steam heating (calculations for saturated steam only) • hot fluid (eg oil) heating.

RANGE STATEMENT**Health, safety
and
environment
(HSE)**

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS512B Determine mass transfer loads

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the application of a knowledge of mass transfer and mass balance principles to the design and use of processing equipment.

Application of the Unit

Application of the unit	In a typical scenario, the mass transfer loads for process equipment or a process is required to be determined. Calculations are performed to determine the mass transfer loads, to help in the diagnosis of plant performance problems, to identify materials efficiencies or losses or for the specification of new or modified equipment. This competency is typically performed by senior technicians. It includes: • calculating mass flow rates • density variations with changes in temperature (and pressure where appropriate) • mass changes resulting from a chemical reaction • mass flow of components of a mixed stream • mass balances. Note that this unit uses the term 'flow rate' and similar terms. This may be the flow rate in terms of kg/h, or kg/batch or similar conceptual flows.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Calculate mass flow rates of streams.	2.1. Calculate mass flow rate of plant streams from volumetric data, correcting for changes in density 2.2. Calculate mass flow rate of individual components of plant streams from their concentrations 2.3. Calculate mass accumulation (+ or -) within a plant item.
3. Calculate mass change due to a chemical reaction.	3.1. Determine yield from reaction of all significant products 3.2. Determine mass output of all significant products arising from the reaction for specified reactant inputs.
4. Conduct mass balance over process components.	4.1. Determine desired boundaries for mass balance calculation 4.2. Determine possible sources of data required from the plant

ELEMENT	PERFORMANCE CRITERIA
	4.3. Match and adjust sources of data to desired boundary for mass balance 4.4. Determine overall mass balance 4.5. Determine mass balance for each significant component/ reactant and product 4.6. Determine the adequacy (or otherwise) of the process/plant heating/cooling system to meet production requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
Competence includes the ability to: - determine the boundaries of the system to be studied - collect the required plant data from measurements, readings or calculated quantities - calculate the mass transfer loads - report the results. Competence also includes the ability, for the practical completion of the job, to apply and/or explain: - changes in density with temperature (and pressure where appropriate) - stoichiometry of chemical reactions - mass balances.
Required knowledge
Knowledge and understanding of mass transfer principles and calculations sufficient to determine the mass transfer loads of an existing or a new 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,

EVIDENCE GUIDE	
the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will typically be by a mass balance project(s). This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to complete a mass balance in a structured way, taking real data from an operating plant. Consistent performance should be demonstrated. In particular look to see that: • realistic boundaries are drawn for the mass balance which align with practical sources of data from the plant • data is collected from the plant with minimum disruption to production • theoretical and practical requirements for the mass balance are consistent • the mass balance data is used to identify and contribute to solutions for plant problems. This will typically be assessed by one or more mass balance projects on an operating plant. One complex mass balance, or a number of simple mass balances, are required to demonstrate competence.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and

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	communication units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	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 mass transfer into and out of all processing equipment and requires the quantitative determination of mass transfer loads. This competency applies to all sectors within the chemical, hydrocarbons and oil refining industry. Mass transfer modes include: • simple (physical) mixing • simple (physical) separation • changes in component mass flow rates due to chemical reaction (including mixing and separation using chemical reaction).
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS520C Manage utilities

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers management of utilities used by a whole site or group of plants with a view to improving the efficiency of usage.

Application of the Unit

Application of the unit	In a typical scenario, a senior plant technician manages the use of utilities which maybe centrally produced and controlled, by all units within the site as a whole (or a significant plant area) and takes actions which will lead to a more efficient use of these utilities. Utilities is used to mean: • steam (saturated and/or superheated) • air (instrument, safety, process and/or mechanical) • water (cooling and/or process) • fuel (gas, oil) • other heating/cooling mediums (oil, 'Dowtherm', brine) • electricity. The plant technician would: • identify sources and uses of the relevant utilities • check the efficiency of use of the utility • take action to increase the efficiency of use of the utility - the action might range from implementing changes to reporting problems and recommendations to coordinating others implementing the changes. Generally this would be a significant role of a senior plant technician who in the exercise of that role would consult and liaise with a range of other personnel and technical experts, both internally and external to the company, within company guidelines. This unit does not apply to the routine monitoring of water systems or utilities which are covered by <i>PMAOPS204B Use utilities and services</i>.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify source and use of all utilities on plant.	1.1. Obtain current services diagram or schematic for plant 1.2. Identify all items of equipment using utilities 1.3. Identify source of each utility 1.4. Identify utility properties (eg pressure, voltage, current) as supplied 1.5. Determine required utility properties (eg from engineering specification) for each item of equipment using each utility.
2. Determine actual consumption of utilities.	2.1. Get information showing consumption of utilities by the plant and plant equipment 2.2. Get information showing actual utility properties as used

ELEMENT	PERFORMANCE CRITERIA
	by each plant item 2.3. Physically check each item of equipment for signs of inefficient utility use, eg faulty steam traps, leaks 2.4. Compile report/database showing actual usage of utilities and observed problems.
3. Determine efficiency of use.	3.1. Determine theoretical consumption of utilities for equipment items from engineering specifications, by calculation or other methods 3.2. Compare actual consumption of utilities with theoretical consumption 3.3. Determine inefficient users of utilities 3.4. Compile report/database showing efficiency of use of utilities.
4. Take required action to improve utility efficiency.	4.1. Rank inefficient users in priority order for remediation based on costs and business requirements 4.2. Investigate and determine cause(s) of inefficiency in the higher ranked users 4.3. Develop plans to remove the causes of inefficiency 4.4. Identify any safety, health and environmental (HSE) implications of planned actions and address prior to any implementation of changes 4.5. Consult with relevant stakeholders regarding HSE implications and the implementation of these plans 4.6. Initiate appropriate action for items within scope of authority 4.7. Follow through on items to facilitate a timely completion 4.8. Report/make recommendations on required improvements which are beyond scope of authority to action.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Ability to:

- identify all utility consuming items on a schematic of the plant, describe the function of each and the purpose of the utility supplied

REQUIRED SKILLS AND KNOWLEDGE

- describe the nature/condition of the utility entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- describe the causes and remedies of common problems in the use of each utility used.

Competence also includes the ability to isolate the causes of problems and to be able to distinguish between causes of problems/alarm/fault indications such as:

- poor/inappropriate quality supply of utility
- equipment failure, eg faulty steam trap, fouled heat exchanger
- operational problem (inappropriate usage pattern of utility).

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- schematics and flow diagrams for the utilities distribution system
- usage of utilities by plants and equipment
- sources of utilities
- utility properties
- requirements for utilities, properties, usage patterns, supply
- efficiencies and usage at the plant or equipment

Competence includes an understanding of the utility usage of the plant and its equipment. It also requires an understanding of each utility used and how its use may be more or less efficient.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Typically this unit will be assessed by a project aimed at improving the efficiency of use of utilities. It may not be appropriate to wait until implementation of change (in Element 4) is complete, and it is acceptable

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	to assess from the plans for implementation. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to undertake a structured analysis of the use of utilities and to justify the recommendations for improvement based on the data. Consistent performance should be demonstrated. In particular look to see that: • plant data is obtained in a manner which does not interfere with production • plant drawings (eg P&IDs) and engineering specifications are interpreted correctly • health, safety and environmental implications of any changes are identified and addressed, by applying the hierarchy of control, prior to any changes being implemented • priorities for action consider all relevant factors such as plant key performance indicators, health, safety and environmental implications, simple, quick solutions versus those requiring a capital project, and other relevant business factors. This will typically be assessed by one or more utilities improvement projects on an operating plant. One complex project, or a number of simple projects, are required to demonstrate competence.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

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	It may be appropriate to co-assess this unit with • <i>PMAOPS511B Determine energy transfer loads</i> • <i>PMAOPS512B Determine mass transfer loads.</i> However, these are not prerequisites or co-requisites as there are other ways of obtaining the data.
Guidance information for assessment	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	
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.	
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which use utilities.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS521C Plan plant shutdown

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the planning of work to be done in a plant shutdown or outage, eg maintenance or inspection shutdown of a plant.

Application of the Unit

Application of the unit	In a typical scenario, a senior plant technician takes a lead technical role in the planning of a plant shutdown such as the maintenance/pressure vessel inspection shut. This competency requires the application of a detailed plant knowledge to the task of developing a detailed shutdown plan. This competency is not actually about the shutting down of the plant itself (see <i>PMAOPS411B Manage plant shutdown and restart</i>), nor decommissioning (see <i>PMASUP441C Decommission plant</i>) but rather about the planning for the activities which will occur during a planned, major shutdown. Shutdown planning is usually a team activity and so this technician would also be working with technical (process) experts, maintenance experts, contractor representatives and liaising with production and other management. The reasons for the shutdown could include: • regulatory vessel inspection (PVI) • major maintenance • upgrades or refits • catalyst and/or column repacking • other activities which are scheduled for the shutdown. Generally this would be a seconded role of a senior plant technician who for the period of the shutdown, and for a significant period before the shutdown, would undertake this as their primary activity.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify maintenance/project and plant requirements.	1.1. Analyse relevant company records to determine activities which have been scheduled for the shutdown 1.2. Obtain information on maintenance activities intended for the shutdown 1.3. Obtain information on production activities intended for the shutdown 1.4. Obtain information on projects or construction activities intended for the shutdown 1.5. Compile a list of all activities intended for the shutdown, including sufficient detail to allow for shutdown planning 1.6. Negotiate conflicts between proposed activities.
2. Identify tasks, timelines and	2.1. Break down each agreed shutdown activity into

ELEMENT	PERFORMANCE CRITERIA
resources.	required tasks 2.2.Determine time, people, material, other resources required and 'owner' for each task 2.3.Determine prerequisite tasks for each task 2.4.Identify conflicts between tasks arising from resources or other causes 2.5.Negotiate conflicts between tasks 2.6.Compile database of all tasks and their requirements.
3. Develop schedule.	3.1.Develop draft shutdown schedule (including planning activities) 3.2.Determine critical path for shutdown tasks 3.3.Analyse tasks on critical path to determine methods of reducing critical path 3.4.Develop revised schedule 3.5.Consult with all relevant stakeholders and analyse revised schedule for conflicts and possible savings 3.6.Negotiate conflicts 3.7.Develop final schedule and critical path.
4. Communicate with all relevant stakeholders.	4.1.Contribute to shutdown planning meetings with stakeholders. 4.2.Meet with stakeholders individually 4.3.Prepare reports and documents as required 4.4.Ensure all permissions required for tasks have been obtained 4.5.Liaise with suppliers and contractors to obtain parts, materials and services.
5. Monitor shutdown.	5.1.Establish systems to allow monitoring of shutdown to schedule 5.2.Monitor progress to schedule 5.3.Identify causes of not meeting schedule 5.4.Negotiate a solution to cause 5.5.Adjust schedule to meet changed circumstances but still meet overall timeline (if at all possible).

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to:

- identify all necessary sequences of activities to ensure safe and efficient shutdown
- negotiate with a range of people to obtain the best outcome for the shutdown from the conflicting priorities
- use planning tools to develop and modify complex plans/schedules
- use planning tools to optimise the plans
- use planning software (eg critical path, PERT or similar methods)
- breakdown work tasks into steps/stages/trades/contractors/parts/designs/spares/tools
- apply knowledge of plant operations, clearance/permits
- logically sort work tasks into sequences
- optimise planned activities into a workable schedule/plan
- re-schedule/adjust/update plans during shutdown
- estimate labour/job times/materials/interactions
- follow plant schematics
- apply process knowledge of plant
- apply mechanical/electrical/instrument knowledge

Required knowledge

Competence includes an understanding of the operation of the plant and its units including:

- principles of operation of entire plant being shut down
- physics and chemistry relevant to the plant being shut down and the materials processed and their hazards/requirements
- plant idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping plant items
- function of major components and their problems

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, the Range Statement and the Assessment Guidelines for the Training Package.

EVIDENCE GUIDE**Overview of assessment**

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Typically this unit will be assessed by a shutdown planning project. It may not be appropriate to wait until the shutdown planning is completed as it may be desirable to test for competence before taking a major role in a shutdown. In this case a simulation should be used.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to undertake a structured analysis of the activities to be completed during the shutdown and then undertaking the planning in a systematic manner.

Consistent performance should be demonstrated. In particular look to see that:

- the plan minimizes the time of the shutdown
- required activities/tasks are actively sought, broken into their components and scheduled
- plant drawings (eg P&IDs) and engineering specifications are interpreted correctly
- priorities for action consider all relevant factors.

This will typically be assessed by a major shutdown project on an operating plant. One complex project, or a number of simple projects, is required to demonstrate competence. As shutdown planning is usually a team activity, it is appropriate to assess the technician while they undertake this activity as part of the team, provided competence in all aspects can be demonstrated.

Context of and specific resources for assessment

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case

EVIDENCE GUIDE	
	studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It may be appropriate to co-assess this unit with • <i>PMASUP410B Develop plant documentation</i>
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which are covered by the shutdown. Where only a plant area is being shut (or one plant in an integrated complex), it also includes the impact of the shut on those areas still operating. Databases may be: • electronic databases (such as Access, DB, Oracle) • other electronic forms (such as spread sheets) • card files • other paper based systems Scheduling may include: • electronic project planning tools (such as MS Project) • other specialised planning software

RANGE STATEMENT	
	• paper techniques
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS522A Coordinate plant shut down

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competence applies to a plant technician who is performing the plant shutdown coordinator role as their primary activity. This is for a planned plant shutdown for maintenance or process activities. The technician will be implementing/executing the shutdown plan rather than developing the shutdown plan. This technician would be part of a team working with technical experts, maintenance experts, contractor representatives, process/production teams and management.

Application of the Unit

Application of the unit	In a typical scenario a complex and integrated plant needs to be shut down for planned maintenance, integrity inspections or process activities. This may be an entire plant/site, or a significant plant/area within that. This requires the coordination of a number of work groups and resources to ensure safe and efficient preparing of equipment for handover to maintenance, contractor or process for shut down activities. This competency does not cover the technician actually shutting down the plant (see <i>PMAOPS411B Manage Plant shutdown and restart</i>) or with the shutdown planning from initial scoping (see <i>PMAOPS521C Plan Plant shutdown</i>) Key aspects of the competency include: • coordinating shutdown sequence to ensure all process shutdown activities completed to schedule • communicating shutdown and equipment preparation activities to all stakeholders in a timely manner • a comprehensive knowledge of plant shutdown events and their impact on upstream and down stream interfaces • efficient identification and utilisation of available resources • effective coordination of a number of teams performing a number activities simultaneously • analyse/problem solve and develop contingencies plans to safely manage

	identify and coordinate pre shutdown preparation requirements

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify shutdown work scope	1.1. Analyse relevant information for activities intended for the shutdown 1.2. Complete a list of all activities intended for shutdown 1.3. Prioritise list and identify all essential work 1.4. Identify conflicts between proposed activities
2. Plan and schedule resources	2.1. Identify each individual task in the shutdown process 2.2. Determine resources required for each task and

ELEMENT	PERFORMANCE CRITERIA
	assign appropriate owner 2.3. Determine prerequisite tasks prior to shutting down process 2.4. Ensure hazards are identified and controls are in place 2.5. Ensure all safety and testing equipment is calibrated and on site prior to shutdown commencing 2.6. Compile a schedule to track shutdown and equipment preparation sequence
3. Co-ordinate plant/ equipment shutdown sequence	3.1. Prepare/review shutdown documentation 3.2. Coordinate plant shutdown as per procedures 3.3. Track plant shutdown progress. 3.4. Coordinate execution of critical function test during shut down phase 3.5. Coordinate equipment preparation 3.6. Validate equipment is safe to handover to appropriate work party.
4. Handover plant/ equipment to relevant work party	4.1. Handover plant and equipment to relevant work group per site protocol 4.2. Perform safety audits during shutdown work 4.3. Record/report HSE non conformance 4.4. Communicate as and when required 4.5. Monitor shutdown work against critical path 4.6. Monitor resource usage and take appropriate action 4.7. Identify barriers to achieving shutdown critical path and negotiate solution.
5. Communicate with all relevant stakeholders	5.1. Communicate shutdown plan/schedule to operations team 5.2. Attend and contribute to regular shutdown progress meetings 5.3. Record and report daily shutdown activities. 5.4. Ensure all authorisations required for tasks have been obtained 5.5. Identify, communicate and manage HSE issues arising during execution of shut down activities 5.6. Contribute to post shutdown review.
6. Return plant to service	6.1. Confirm that all scheduled work on equipment is complete before hand back is accepted 6.2. Ensure equipment hand back documentation

ELEMENT	PERFORMANCE CRITERIA
	complete per site protocol 6.3. Coordinate pre-start equipment integrity checks 6.4. Coordinate and validate plant de-isolation and preparation for service 6.5. Ensure appropriate plant start up authority is obtained 6.6. Coordinate start up critical function tests as required 6.7. Coordinate and record plant start up progress

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence also includes the ability to:

- interpret shutdown schedule/planning tools (eg Gant chart, MS project, Primavera)
- identify and manage HSE risks using appropriate tools (eg HAZOPS, JHA)
- coordinate a number of tasks simultaneously
- apply legislative requirements and company policies and procedure
- solve problems
- monitor and coordinate resource requirements
- communicate
- write or review and apply documentation
- lead teams
- undertake structured analysis of shutdown activities before and during the shutdown

Required knowledge

Competence in this unit includes the following knowledge:

- detailed principles of operation of the plant involved in the shut down
- overview of the principles of operation of and any upstream and downstream processes
- HSE impact of any shutdown
- plant/equipment/processes impacted by the shutdown
- safe working practices related to the type of plant and equipment being shut down and worked on
- interpretation of work scope and identification of conflicts
- analysis of planned sequences of events to identify possible conflicts

REQUIRED SKILLS AND KNOWLEDGE

- organisation computer applications (eg those used to track/record shutdown schedule)
- interpret complicated P&IDs, PFDs, etc.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Typically this unit will be assessed by a shutdown planning project. As shutdowns may not occur with sufficient frequency or planning to allow for assessment of all elements, performance criteria, required skills and knowledge, simulation may be required to assess some aspects of this competency.

This unit of competency requires a significant body of knowledge, which will be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to undertake a structured analysis of the activities to be completed during the shutdown and then undertaking the coordination in a systematic manner.

Consistent performance should be demonstrated, in the following:

- in-depth analysis of all proposed shut down activities to eliminate conflicts and minimise the shutdown critical path
- resource management maximises pre shutdown preparations to minimise interruptions to the critical path

EVIDENCE GUIDE	
	• coordinate shutdown team to ensure safe and efficient plant shutdown and preparation per procedures without incident. • coordinate track shutdown activities to ensure critical path milestones are reached per plan • contingencies are developed to overcome unforeseen barriers to plan • record and report all aspects of shutdown activities to stakeholders per enterprise protocol
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions, which will be used to probe the reasoning behind the observable actions
Method of assessment	Typically this unit will be assessed by performing a shutdown coordination project. Assessment should be evidence based through direct observation and the compilation of an evidence portfolio to support the Elements, Performance Criteria, Skills and Knowledge requirements of this competency It may be appropriate to assess this unit concurrently with other relevant units
Guidance information for assessment	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	
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 italicized 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.	
Codes of practice/	Where reference is made to industry codes of practice, and/or

RANGE STATEMENT	
standards	Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations, which are covered by the shutdown. Where only a plant area is being shut (or one plant in an integrated complex), it also includes the impact of the shut on those areas still operating.
Reason for shut down	The reason for plant shut down may include: - planned shutdown for regulatory vessel inspections - major maintenance - catalyst or column regeneration/repacking - other activities requiring plant shutdown to access
Organisation systems	Organisation systems applications/data bases may include: - MAXIMO/SAP or other relevant work management tool as appropriate for area of responsibility - Scheduling tools such as MS Project, Excel, Gant Chart, Primavera or similar - other electronic recording / reporting software systems - paper based reports/record systems
Hazard identification tools	Hazard Identification tools may include but not be limited to: - hazard and operability studies (HAZOP) - hazard analysis studies (HAZAN) - job hazard/safety analysis (JHA/JSA) - safe work method statements (SWMS) - risk matrix
Activities intended for shutdown	Activities intended for shutdown may come from: - maintenance planning - process/production records - other sources
Resources required for task	Resources required for task include: - time - people - material - other
Resource requirements	Resource requirements may include but not limited to: - utility services such as steam, nitrogen, power, water, chemicals - workforce such as operators, maintenance, contractors, engineers, laboratory staff, safety observer, standby rescue crew

RANGE STATEMENT	
	• mobile equipment such as elevated work platforms, Hiab, vacuum trucks, drip trays • other equipment such as hoses, plugs and caps, scaffold, extra fire protection equipment
Shut down documentation	Shut down documentation include: • procedures • packages • isolation lists • blinds list • punch lists
Equipment preparation	Equipment preparation includes: • isolation • blinding/spading • purging • ventilation • washing
Communication	Communication includes: • preparations • overnight activities • progress • problems • potential delays
Health Safety and Environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS550B Develop a colour formulation

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the development of a new formulation, suitable for production, of a colour to match a sample/customer requirements. It includes both computer and visual colour matching and the adjustment of a computer suggested formulation to suit company conditions and standard materials/colourants.

Application of the Unit

Application of the unit	In a typical scenario, a technologist is given a colour sample, or colour description, and needs to develop a formulation. The formulation would be suitable for production by the company and produce a final product which meets the colour requirements of the customer. The development would include factory trials and modifications to the formulation. Typically the development will be of a new colour for an existing product of another colour. It may include the colour aspects (only) of developing a totally new product. This unit does not include the development of any aspect of the product other than its colour. The technologist would: • identify potential manufacturing problems associated with the colour formulation and propose/implement solutions • analyse the production trials from the standpoint of the desired colour and the impact of the colour requirements on the production process and make modifications to ensure a product of stable colour and suitable manufacturing process. Generally the technologist would be part of a team for the total development of a new product, but may develop the colour formulation for a new colour for an existing product independently. The technologist would liaise with relevant production and other personnel for production trials.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	<i>PMAOPS350B</i>	<i>Match and adjust colour</i>
	<i>PMAOPS450B</i>	<i>Solve colour problems</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Confirm design brief of new colour.	1.1. Communicate with customer and other key stakeholders and agree on: 1.1.1. colour/colour specification 1.1.2. surface finish/gloss 1.1.3. viewing conditions (lighting) 1.1.4. opacity 1.1.5. requirements for metamerism/non-metamerism match 1.1.6. other aesthetic requirements 1.2. Determine end use of product, eg interior, exterior, automotive 1.3. Develop and validate design brief to meet needs.

ELEMENT	PERFORMANCE CRITERIA
2. Determine initial colour formulation.	2.1. Analyse colour sample (where provided) using colour computer and/or eye and predict possible colour formulation 2.2. Compare predicted formulation with company/customer preferred colourants. 2.3. Adjust predicted formulation to use preferred colourants. 2.4. Check that the adjusted formulation complies with design brief.
3. Conduct small scale trials.	3.1. Make/arrange for small batch to adjusted formulation 3.2. Undertake trials to determine optimum processing conditions where relevant 3.3. Analyse colour of sample product and compare to design brief 3.4. Modify formulation and processing (where relevant) to have simplicity of manufacture and to meet brief.
4. Assess hazards.	4.1. Identify hazards arising from colour formulation and processing 4.2. Assess risks arising from those hazards 4.3. Determine appropriate action to control risks in accordance with hierarchy of control and duty of care 4.4. Take required action before proceeding to trial.
5. Trial new colour formulation through the process.	5.1. Design trial to procedure to deliver required information 5.2. Ensure OHS and environmental requirements are stringently observed 5.3. Coordinate the trialing of the new product 5.4. Interpret colour trial results and guide colour trial process 5.5. Adjust formulation, and if appropriate tune process, to optimise production of new colour.
6. Coordinate evaluation and testing.	6.1. Determine colour testing and evaluation regime required to meet end use requirements, including regulatory/industry code requirements 6.2. Arrange for testing and evaluation of trial colour 6.3. Interpret colour trial results 6.4. Modify formulation and conduct new trials as required 6.5. Determine final formulation and processing specifications.
7. Implement procedures for new colour.	7.1. Monitor initial production and adjust process, conditions and formulation to make the process a smooth operation 7.2. Ensure process specifications reflect the optimised operation developed 7.3. Ensure quality standards and procedures meet requirements

ELEMENT	PERFORMANCE CRITERIA
	of design brief 7.4. Ensure procedures are correct for the new colour 7.5. Ensure project records are complete and all required reports have been completed and submitted 7.6. Archive records according to procedure.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

This competency requires skills of:

- communication
- interrogation
- observation
- analysis

Required knowledge

Competence includes an understanding of colour, the interaction of colourants and the impacts of processing variables on the final colour of then product. In particular it includes the ability where relevant to:

- interpret the 'flare path' on a tonal graph of tone vs time
- choose the optimum grind/particle size for the required colour
- balance gloss, opacity and tone
- substitute colourants recommended from a 'computer match' for other colourants
- make both metameric and non-metameric matches
- determine the hazards arising from the colourants chosen
- interpret weathering and other test data relevant to colour and the use of colour
- describe the causes and remedies of common problems such as those selected in the Range Statement.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the compressor system and to be able to distinguish between causes of problems such as:

- wrong colourant
- wrong colourant amount
- wrong grind time/particle size

REQUIRED SKILLS AND KNOWLEDGE

- wrong wetting/dispersing.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by developing colour formulations in a plant, laboratory or other relevant context. Assessment will occur over a range of situations which will include different design briefs.

Simulation may be required for assessment of this unit of competency. Simulation should be based on actual colour formulation developments. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the predicting possible problems and determining actions required to avoid the difficulty.

Consistent performance should be demonstrated. In particular look to see that:

- predicted colour formulations are reasonable
- adjustments to formulations are made based on a rational interpretation of the results and an understanding of colour and the process

These aspects may be best assessed using a range of colour formulation development projects backed up by scenarios/case studies/what-ifs. These assessment activities should include a range of problems, including new, unusual and improbable situations

EVIDENCE GUIDE	
	which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require a suitable method of gathering evidence of colour formulation ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency covers the development of a new colour formulation 'from scratch', usually based on a provided colour sample. The formulation would normally use colourants already available within the company (preferred colourants), but does not preclude the use of colourants which are novel/new to the company. It may be applied to any industry sector requiring the development of a new colour formulation such as: • paint

RANGE STATEMENT	
	• ink • plastics • rubber • concrete products • glass products • clay/ceramic products.
Typical problems	Typical problems may include: • matching under different lighting conditions • variable surface finish/gloss level • non-metameric matching • process caused colour differences.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMAOPS560A Plan and design tailings management facilities

Modification History

Release 1 – New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to plan and design the management of tailings disposals and disposal sites; risk identification and management strategies (business and environmental); and responses to threats to tailings site integrity.

Application of the Unit

This unit applies to a person who has the responsibility for the planning and design of a company's tailings waste management system or the planning and design of tailings specific disposal sites from the early stage metalliferous processes. This would include the planning and design of an environmental management system focused on continual improvement to review, prevent, mitigate or ameliorate adverse environmental impacts and which will provide for the safe storage and disposal of residual wastes and process residues. The type of people to whom this unit may apply include (but are not limited to):

- environmental department manager/officer
- occupational health and safety manager/officer
- operations manager/officer
- site maintenance manager/officer
- inspection and monitoring manager/officer
- frontline manager.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

This unit applies where the activities of a metals or minerals processing plant produces waste in the form of tailings (e.g. slag and slurry) or wastewater.

This unit requires a detailed knowledge about the characteristics of tailings (particularly as they will occur in regard to the facility for which the tailings waste management system is being planned and designed), the design of the tailings management facility, methods of tailings disposal and deposition and associated equipment, water balance issues and environmental risks. Understanding of related processes and plant procedures which produce tailings would be beneficial.

This unit has been written with a focus on early stage metal beneficiation processes in mind, particularly in regard to processes associated with aluminium, iron, gold, copper, tin, silver, lead and zinc. Tailings management facilities may have deposited material suspended in varying levels of water ranging from slurry (e.g. 'red mud'), through high slump pastes (e.g. filter cake) to low slump pastes, but the focus has been on sub-aerial deposition (not subaqueous or sea deposition). While not specifically considered, the unit should also be applicable to other types of waste that might be deposited in a tailings management facility, including overburden and possibly slag or other solid waste products from later metalliferous processes with appropriate contextualisation.

Licensing/Regulatory Information

State regulation of tailings storage facility design, construction and ongoing management may be covered by specific legislation (e.g. New South Wales the Dams Safety Committee oversees tailings containment regulation under the Dams Safety Act, 1978.) Different jurisdictions may also issue their own tailings management guidelines and where these exist they must be adhered to.

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	Prepare for work	1.1	Identify work requirements
		1.2	Identify and control work health and safety (WHS) hazards and identify risks to the environment
		1.3	Coordinate with appropriate personnel, including facility managers and team members
2	Research waste/tailings management requirements	2.1	Research and identify the type and volume of waste generated from process operations
		2.2	Research and identify the type and amount of waste management equipment required
		2.3	Research and identify specific legislation required for the development of tailings storage facility design, construction and ongoing management
		2.4	Identify any organisational specific waste management requirements, practices or processes
		2.5	Search for and cost out tailings equipment, resources, development and maintenance requirements
		2.6	Research waste risk management plans and practices
		2.7	Research environmental, WHS and community implications to waste management plan and design
		2.8	Consolidate findings from waste/tailings management requirements research and use to inform planning and design considerations
3	Undertake site investigations	3.1	Conduct initial site visit to inform the planning and design of tailings management facility requirements
		3.2	Determine facility needs, including scope for variety (i.e. throughout shifts, time and processes) using measured/indicated data and senses (e.g. sight and hearing), as appropriate
		3.3	Plan contingencies for developing or future situations which may require action to be pre-planned
		3.4	Adjust initial planning and design plans, as appropriate,

- to incorporate findings of investigations
- 3.5 Collect samples and information from site visit for further investigation to inform waste management planning and design
 - 3.6 Identify key operating personnel, practices and equipment to be considered in the planning and design phase
- 4 Analyse and assess design criteria
- 4.1 Analyse and assess the design criteria requirements for the type and volume of waste generated from process operations
 - 4.2 Analyse and assess the design criteria for the type and amount of waste management equipment required
 - 4.3 Analyse and assess design criteria based on the specific legislation required
 - 4.4 Analyse and assess design criteria in line with organisational specific waste management requirements, practices or processes
 - 4.5 Analyse and assess tailings equipment, resources, development and maintenance requirements, and cost implications
 - 4.6 Analyse and assess risk management plan design criteria
 - 4.7 Analyse and assess implications to operational personnel, training needs and human resource requirements
 - 4.8 Analyse and assess safety concerns
- 5 Assist drafting of tailings management plan
- 5.1 Plan and review tailings management scope
 - 5.2 Develop timeline, schedule, milestone dates and time management plan
 - 5.3 Develop cost management plan with built-in review and tracking processes
 - 5.4 Develop quality management criteria plan with periodic reviews

- 5.5 Develop skill, knowledge, training and human resource requirements with built-in review processes
- 5.6 Develop information generation, distribution and communication plan with structured review of outcomes
- 5.7 Develop risk management plan with risk management strategies, issues registers, opportunities identification and review of outcomes protocols
- 5.8 Develop procurement management plan complete with procurement criteria and requirements, procurement contract management processes and review periods

Required Skills and Knowledge

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

Required skills

Required skills include:

- conducting a range of tests, site visits and research to identify tailings facility requirements, including for water treatment and storage, dam wall capacity, and so on
- interpreting outcomes from tests performed and research undertaken
- determining and planning for conditions which will lead to out of specification operations
- planning and developing enterprise procedures for the waste/tailings management plan with time constraints considered and for a manner relevant to the correct use of the equipment
- identifying, collecting and conveying information relevant to the plan facility clearly and effectively
- using communication technology
- driving vehicles in remote settings with limited support, as required
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents, calculate various indices and interpret technical information
- applying mathematics to the level of year 10

Required knowledge

Required knowledge, to the breadth and depth required for the operation of the tailings management facilities and gathering systems, includes:

- principles of operation of waste treatment and management of different tailings and water types, volumes and consistency
- process parameters and limits of tailings disposal plant (e.g. pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- typical issues causing problems (plant/equipment, process, environmental) and the resolution of those problems
- relevant alarms and actions
- physics and chemistry relevant to the tailings being managed and their chemical, physical, handling and placement characteristics
- relevant environmental and heritage requirements
- mathematical formulae and their application to waste management calculations, as needed

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

Critical aspects for assessment and evidence are:

- work requirements are identified
- appropriate routine checks, logs and paperwork are completed and appropriate action planned, as required
- plant and facility requirements are properly considered
- potential problems are identified and responses planned
- work environment and equipment are made safe for use.

Context of and specific resources for assessment

Assessment of this competency will occur over a range of situations which will include typical disruptions to normal, smooth operation. This will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability. Where safety, lack of opportunity or significant cost is an issue an

industry-based simulation may be employed to assist the process.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the site and consistent with workplace systems or procedures.

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

Procedures may be written, verbal, computer-based or in some other form. They may include but are not limited to:

- all work instructions
- standard operating procedures
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant
- good operating practice as may be defined by industry codes of practice

Procedures would be expected to comply with any relevant government regulations.

Logs and reports

Logs and reports may include:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

Appropriate action

Appropriate action includes, but is not limited to:

- collecting information as required in the form of pictures, notes, equipment and waste samples, and

so on

- determining potential problems which may require action to be pre-planned
- accessing and applying relevant technical and plant data for planning and design purposes
- considering appropriate problem solving techniques for possible faults
- planning for problem rectification by applying appropriate solution techniques to areas of responsibility
- planning for possible incident items until final resolution has occurred
- developing problem reporting processes and structures for outside area of responsibility/ability to designated person

Typical problems

Typical problems may include, but are not limited to:

- insufficient appreciation given to possible rupture of the tailings slurry delivery pipeline or decant water return pipeline
- lack of full consideration of rainfall induced erosion of the tailings facility containment wall or water imbalance
- poor understanding of and planning for geotechnical failure/excessive deformation of containment wall
- lack of provision planned for overfilling with tailings beyond management facility capacity, especially the result of unpredicted tailings production
- unplanned seepage of hazardous materials through the dam wall or through the foundation into the ground water
- insufficient design to protect against dust emissions especially of toxic materials
- unplanned or uncontained floodwater in high rainfall areas

Tailings/waste characteristics

Tailings/waste characteristics include:

- mineralogy: residual resource potential, and plant nutrients
- chemical reactivity: toxicity, leachate potential, acid producing potential, spontaneous combustion, cementation/hydration and weathering
- physical characteristics: particle size distribution, particle density compressibility, shear strength,

liquefaction potential, erodibility and dusting potential

- placement characteristics: placed dry density, particle sorting, permeability, bearing capacity and initial placement density
- handling characteristics: solids content of slurries, trafficability during placement, flocculation/settling time and abrasiveness

Tailings disposal strategy

Tailings disposal strategy can include:

- the location of discharge points
- the rotation sequence for discharges
- the duration of deposition in an area
- the location of settling ponds and decant facilities
- the location and timing of intermediate paddock bunding
- the likely landform created by the deposition processes at stages throughout operations up to and including final landform
- flowable volumes and potential flow paths
- operational maintenance requirements (e.g. dust suppression, fauna exclusion and drainage)

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Work requirements

Work requirements may come from briefings, handovers and work orders and may include:

- compliance documentation
- product specifications
- nature and scope of tasks
- achievement targets
- operational conditions
- geological data
- site survey data
- site layout and out of bounds areas
- worksite inspection requirements
- lighting conditions
- plant or equipment defects
- hazards and potential hazards

- coordination requirements or issues

Unit Sector(s)

Competency field Operational/technical

Unit sector

Custom Content Section

Not applicable.

PMAOPS600C Modify plant

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the process specification, selection or management of the equipment and supervision of the installation and commissioning of the modification to a plant.

Application of the Unit

Application of the unit	In a typical scenario, it has been identified that modifications need to be made to the plant, and equipment needs to be chosen to undertake these modifications. The identification of the need for modification is not part of this unit, and it may have arisen from any number of possible sources. This competency does not require the design of equipment (which would typically be an engineering role), but does require the process specification of the equipment and the matching of performance specifications of off-the-shelf and/or tendered equipment to the required specification. It also requires the selection of the most appropriate item. This competency assumes that the technician responsible for these modifications takes the overall responsibility for the modifications, but would work with the support of other company and external experts. This extends to the coordination of the installation of the modified equipment. This unit does not cover the optimisation of plant by modification of process, procedures or practice (<i>see MSAPMOPS400A Optimise process/plant area</i>) as it is to do with the modification of plant hardware. This unit does not cover work requiring special certification (eg registered structural engineer) but may include working with such people and providing process and product expertise.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Confirm required outcomes from modification.	1.1. Communicate with relevant technical, operational and other key personnel, to determine operational and technical requirements of the plant modification. 1.2. Determine regulatory/industry code requirements 1.3. Obtain relevant drawings of existing plant 1.4. Develop modification brief, including relevant plant schematic sketch, to meet needs 1.5. Establish required performance measures to indicate success of project 1.6. Obtain 'sign off' on modification brief from all relevant persons.
2. Short list possible modifications to meet brief.	2.1. Investigate the range of available equipment/plant units 2.2. Determine relative advantages and disadvantages of each class of equipment/type of modification which may provide a solution

ELEMENT	PERFORMANCE CRITERIA
	2.3. Compile a shortlist of modification types/equipment classes which will best meet the modification brief 2.4. Discuss shortlist alternatives with relevant stakeholders and obtain 'sign off' for the chosen approach.
3. Select technically best equipment/unit/modification.	3.1. Complete technical specification for required modification incorporating feedback received 3.2. Compare specification with that of 'off the shelf' equipment where appropriate 3.3. Arrange for equipment suppliers to tender to the specification where necessary, following company procedures 3.4. Rank competing items by their compliance with the technical specification.
4. Compare hazard profile of possible modifications.	4.1. Organise a hazard analysis (eg HAZOP) for the modification according to company procedures 4.2. Ensure that all stakeholders are represented on the hazard analysis team 4.3. Brief the hazard analysis team on the modification and the alternatives under evaluation 4.4. Eliminate alternatives which do not meet hazard requirements 4.5. Rank remaining competing items by safety performance.
5. Make final choice of solution.	5.1. Evaluate competing items by their economic performance (eg, life, maintenance, running costs) and rank by total lifetime cost 5.2. Seek further information where necessary to allow a rational selection to be made 5.3. Choose the modification which meets all required minimum standards and will provide the best solution 5.4. Verify choice in discussion with production and engineering managers and other key stakeholders 5.5. Arrange for order to be placed, following company procedures.
6. Check and commission modification.	6.1. Undertake pre-commissioning activities 6.2. Complete safety acceptance documentation 6.3. Identify, record and report problems or non-conformances

ELEMENT	PERFORMANCE CRITERIA
	6.4. Conduct trials/test runs 6.5. Record and report performance data 6.6. Bring the plant/plant systems/pipeline on line.
7. Complete modification.	7.1. Evaluate performance of modification 7.2. Make adjustments as required 7.3. Accept (or otherwise) the equipment/unit (and ensure payment flows) 7.4. Ensure plant procedures and training material updated 7.5. Ensure plant drawings and engineering specifications are updated 7.6. Complete all other required paperwork.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills Competence includes the ability to read and interpret: - plant schematics (eg P&IDs, PFDs, instrument and process diagrams) - construction or layout drawings equipment designs, specifications and manufacturer data Discuss and negotiate with other appropriate personnel to agree necessary and desirable: - technical requirements - operations requirements - timelines - cost and other requirements
Required knowledge Demonstration of competence in this unit must include knowledge of the following: - the operations of the plant and each major unit in it - the principles of operation of the equipment being investigated to the extent required to interpret technical specifications in a meaningful manner - the basics of plant economics and whole of life costing - hazard analysis principles (while it is beneficial, it is not expected that the candidate will

REQUIRED SKILLS AND KNOWLEDGE

be able to undertake HAZOP (or similar) analyses but will understand basic principles and be able to interpret and use the outcomes)

- typical hazards with the type of equipment being investigated
- OHS legislative requirements related to plant including registration and documentation requirements related to modification of registered plant

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to specify the requirements and then select the best solution to meet the necessary and desirable requirements.

In particular look to see that:

- safety, technical and economic aspects are all considered

EVIDENCE GUIDE	
	- the decision made can be justified on those criteria - all key stakeholders are kept well informed and agree with the decisions - the modification, and particularly its timelines, are a good fit for the overall plant requirements - obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. This will typically be assessed by a modification project on an operating plant. One complex project, or a number of simple projects, are required to demonstrate competence.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It may be appropriate to assess this unit concurrently with: <i>PMASUP410B Develop plant documentation</i> <i>MSAPMOHS401A Assess risk.</i>
Guidance information for assessment	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
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

RANGE STATEMENT	
candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	The need for the modification may arise from a continuous improvement project, as a result of an analysis of plant performance or from any other source. The modification may require the selection of any number of items of equipment such as: • pumps • heat exchangers • mixers • separators • columns • reaction kettles. • Classes of equipment (see Element 2) means the selection between different members of an overall class such as: • heat exchangers - various types of shell and tube, plate etc • mixers - propellers, impellers, jet mixing etc • packed columns - rings, saddles etc • kettles - jacketed, coiled etc. Required minimum standards include: • OHS legislative requirements related to plant • industry and enterprise OHS standards • enterprise standards related to maintenance • output requirements • economic performance
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS601A Debottleneck plant

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, it is desired to increase the throughput of a plant. A study is undertaken to identify the rate limiting step/process/plant unit (bottleneck) and then changes are made to plant or process conditions to increase the throughput of this unit. The making of plant modifications is not part of this unit (see <i>PMAOPS600C Modify plant</i>). This competency may require the technician to work with technical experts to complete the debottlenecking project. Typically this unit would be applied to either a small plant or a section/area of a larger plant.

Application of the Unit

Application of the unit	This competency assumes that the technician responsible for the debottlenecking takes the overall responsibility for the project, but would work with the support of other company and external experts. This extends to the coordination of the required modifications/changes. This unit does not cover the optimisation of plant by modification of process, procedures or practice (see <i>MSAPMOPS400A Optimise process/plant area</i>). This unit does not cover work requiring special certification (eg, registered structural engineer) but may include working with such people and providing process and product expertise.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify rate limiting step/process.	1.1. Determine throughput of plant/area 1.2. Determine capacity of units within plant/area based on design and/or performance data 1.3. Identify which unit(s) is operating at capacity/is the bottleneck
2. Investigate bottleneck.	2.1. Analyse the science of what is occurring in the bottle neck unit 2.2. Analyse the engineering/design specification of the bottle neck unit 2.3. Determine the root cause of the capacity limitation of the bottleneck unit 2.4. Investigate methods of increasing the capacity of the bottle neck unit 2.5. List solutions to the bottle neck.
3. Select technically best solution.	3.1. Investigate impact of solutions on the other units of the plant/area 3.2. Identify any 'knock on' effects of solution 3.3. Determine process/quality benefits and costs of solutions 3.4. Determine economic benefits and costs of solutions 3.5. Short list and rank the best solutions.

ELEMENT	PERFORMANCE CRITERIA
4. Compare hazard profile of possible solutions.	4.1. Organise a hazard analysis (eg HAZOP) for the solutions according to company procedures 4.2. Ensure that all stakeholders are represented on the hazard analysis team 4.3. Brief the hazard analysis team on the problem and solution alternatives under evaluation 4.4. Eliminate alternatives which do not meet hazard requirements 4.5. Rank remaining competing items by safety performance.
5. Make final choice of solution.	5.1. Seek further information where necessary to allow a rational selection to be made 5.2. Choose the solution which meets all required minimum standards and will provide the best solution 5.3. Verify choice in discussion with production and engineering managers and other key stakeholders 5.4. Obtain necessary approvals/authorisations
6. Check solution.	6.1. Initiate and monitor the implementation of the solution. 6.2. Ensure all checks and acceptances are done to procedures 6.3. Conduct trials/test runs as required 6.4. Collect and analyse data.
7. Complete modification.	7.1. Evaluate performance of solution 7.2. Make adjustments as required 7.3. Ensure plant procedures and training material updated 7.4. Ensure plant drawings and engineering specifications are updated 7.5. Complete all other required paperwork.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

This competency includes the following skills:

REQUIRED SKILLS AND KNOWLEDGE

- analysis
- mathematics
- communication
- prioritisation
- leadership

Required knowledge

Competence in this unit includes the following knowledge:

- the operations of the plant and each major unit in it
- the principles of operation of the equipment being investigated to the extent required to interpret technical specifications in a meaningful manner
- material and/or energy balances
- the basics of plant economics and whole of life costing
- hazard analysis principles (while it is beneficial, it is not expected that the candidate will be able to undertake HAZOP (or similar) analyses but will understand basic principles and be able to interpret and use the outcomes)
- typical hazards with the type of processes being investigated
- OHS legislative requirements related to plant, including registration and documentation requirements related to modification of registered plant

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may

EVIDENCE GUIDE	
	also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to specify the requirements and then select the best solution to meet the necessary and desirable requirements. In particular look to see that: • safety, technical and economic aspects are all considered • the decision made can be justified on those criteria • all key stakeholders are kept well informed and agree with the decisions • the modification, and particularly its timelines, are a good fit for the overall plant requirements • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. This will typically be assessed by a modification project on an operating plant. One complex project, or a number of simple projects, are required to demonstrate competence.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It may be appropriate to assess this unit concurrently with units which deal with:

EVIDENCE GUIDE	
	• plant documentation • assessing risk. • energy and mass balances • plant modifications
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	The need for the modification may arise from a continuous improvement project, as a result of an analysis of plant performance or from any other source. Required minimum standards include: • OHS legislative requirements related to plant • industry and enterprise OHS standards • enterprise standards related to maintenance • output requirements • economic performance
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS751A Apply physiochemical knowledge to select raw materials for surface coatings

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers an overview of the raw materials and their properties used in surface coatings and their contribution to the final properties of the coating. This competency would typically be required by a person with a technical background needing to acquire knowledge and skills in the surface coatings manufacture and applications area.

Application of the Unit

Application of the unit	This competency applies to technicians, senior technical officers, laboratory supervisors and research and development personnel requiring a firm foundation in the correct use of raw materials for surface coatings. It includes: • formulating • selection of raw materials • manufacturing applications • raw material calculations • environmental aspects of raw material usage • restrictions of use of raw materials for surface coatings • cost variables • identify toxic raw materials and their relevant use

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Apply knowledge of polymers to surface coating properties.	1.1. Predict coating properties related to nature of polymer base. 1.2. Calculate the molecular weight of a polymer. 1.3. Distinguish between the characteristics of solution emulsion and dispersion polymers. 1.4. Identify the effects of monomer selection on product properties.
2. Select resins for surface coatings.	2.1. Distinguish between the characteristics and uses of surface coating resins 2.2. Select a resin for a typical end use.
3. Select additives for surface coatings.	3.1. Identify the principal additives used in coatings 3.2. Distinguish between the characteristics and uses additives 3.3. Select an additive for a typical end use.
4. Design a solvent system for surface coatings	4.1. Identify the role and behaviour of solvent types and their properties. 4.2. Select solvents which may be suitable for an

ELEMENT	PERFORMANCE CRITERIA
	application. 4.3.Recommend a solvent system by applying solvent system design principles and solubility parameters.
5. Select pigments for a surface coating.	5.1.Balance the relationship between particle size, gloss and opacity to achieve required outcome. 5.2.Distinguish between organic and inorganic pigment. 5.3.Identify applications for TiO ₂ pigments. 5.4.Evaluate the need for the use of anti corrosive pigments. 5.5.Verify the need for extenders 5.6.Select a pigment combination for a typical application.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
This competency includes the following skills: • analysis • selection • discrimination • maths
Required knowledge
Competence in this unit includes the following knowledge: • chemistry of raw materials • material safety data sheets • aware of OHS requirements • calculate the molecular weight of a polymer to determine the effects on the end product • polymers used in surface coatings and their impact of the surface coating properties and applications • the importance and impact of polymer functional groups • properties and applications of resins • the manufacturing techniques of alkyd resins

REQUIRED SKILLS AND KNOWLEDGE

- the effects of additives on the final properties of surface coatings
- safety and environmental concerns in the use and handling of solvents
- glass transition temperature of polymers and film forming mechanisms
- the principles of emulsion polymerisation
- the different types of resins used in the surface coatings
- the effects of additives on the final properties of surface coatings
- the role and behaviour of solvents
- the process of solvent evaporation used in formulating
- the functions of pigments
- reasons for the use of inorganic and organic pigments
- key differences between organic and inorganic pigments
- the performance properties of TiO₂ pigments.
- the use of anti corrosive pigments.
- the role and properties of extenders
- overall, the reasons for the selection of raw materials when used in surface coatings.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through

EVIDENCE GUIDE	
	questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to formulate an appropriate surface coating using correct raw materials. In particular: • correct selection and detailed use of relevant raw materials • formulate a coating to customer's requirements • understand the use of raw materials. • describe the impact of certain raw materials on the environment
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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	
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 italicized 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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

RANGE STATEMENT	
Context	This competency applies to the formulation of surface coatings using relevant raw materials.
Surface coating resins	Surface coating resins include: • synthetic resins with drying oils. • alkyd resins • modified alkyd resin • epoxy resins. • saturated and unsaturated polyester resins. • vinyl resin solutions. • thermosetting acrylic resins. • phenolic resins.
Characteristics and uses of resins	Characteristics and uses include: • chemistry • structure • physical and chemical properties relevant to surface coating • modification reactions as relevant (eg alkyds)
Surface coating additives	Surface coating additives include: • cellulose • nitrocellulose • cellulose esters, and • cellulose ethers.
Characteristics and uses of additives	Characteristics and uses include: • nature • structure • properties • uses
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: • batch cards • manufacturing instructions • product data sheets • material safety data sheets (MSDS) • quality management systems • OHS procedures and policies

RANGE STATEMENT

Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS752A Develop a decorative coating

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the identification of the key requirements for the formulation and manufacture of decorative coatings and the transfer of customer needs into appropriate formulations. This competency would typically be required by a person with a technical background needing to acquire knowledge and skills in the surface coatings manufacture and applications area.

Application of the Unit

Application of the unit	This competency applies to technicians, senior technical officers, laboratory supervisors and research and development personnel requiring a firm foundation in the correct use of raw materials for surface coatings. It includes: • formulating appropriate formulas for decorative coatings. • identifying and recognising application methods. • formulating to specified manufacturing parameters. • developing formulas to appropriate manufacturing methods. • ensuring that formulated products meet critical formulation parameters • understanding the functional properties of raw materials and the chemistry of their mixtures • cost variables • identifying toxic/hazardous raw materials and their relevant use • correctly selecting test procedures to ensure product conformance to required specification.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Formulate a decorative coating.	1.1.Determine the effect on performance characteristics of formulation parameters s. 1.2.Specify required quality control and performance tests 1.3.Recommend appropriate raw materials 1.4.Recommend appropriate raw material suppliers 1.5.Formulate a decorative coating to specified parameters. 1.6.Ensure laboratory formulations are converted to production scale.
2. Specify the relationship of pigment/binder for a coating.	2.1.Define pigment/binder relationships and their impact on coating properties. 2.2.Calculate Pigment/Binder ratio, Pigment Volume Concentration (PVC) 2.3.Specify pigment/binder relationships appropriate for a coating.
3. Recommend a method of	3.1.Identify critical formulation parameters and the

ELEMENT	PERFORMANCE CRITERIA
manufacture.	effect on manufacturing characteristics for decorative coatings. 3.2. Determine dispersion, let down and mixing required. 3.3. Select the types of equipment required for coating manufacture 3.4. Recommend a method of manufacture.
4. Identify and control hazards.	4.1. Identify material hazards. 4.2. Identify regulatory requirements. 4.3. Identify other hazards from the manufacture of decorative coatings 4.4. Recommend appropriate hazard control.
5. Recommend a coating application method.	5.1. Distinguish between common decorative coating application methods 5.2. Recommend an application method for decorative coatings.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
This competency includes the following skills: • analysis • selection • discrimination • maths
Required knowledge
Competence in this unit includes the following knowledge: • select appropriate raw materials and have knowledge of their chemistry • select appropriate manufacturing equipment based on their principles of operation • formulation parameters • flow point curves • MSDSs • toxicity and other hazards of raw materials

REQUIRED SKILLS AND KNOWLEDGE

- other OHS requirements
- maintenance of records to substantiate and justify chosen formulations
- the role of the formulator
- the function of raw materials
- selection of appropriate raw materials
- impact of differing raw material suppliers
- principles of dispersion, let down and mixing
- identify the different types of equipment used for coating manufacture
- establishment of the specification of the product to be formulated
- establishment of the manufacturing procedure that will convert the selected raw materials into the specified product on a production scale.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to formulate an appropriate surface coating using correct raw materials. In particular: • formulate a decorative coating to customer's requirement • formulate to a cost benefit • manufacture using appropriate equipment • select appropriate test methods • make recommendations to improve formula
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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	
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 italicized 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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	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 practical techniques used by the formulator in the selection of raw materials and their correct combination to develop a new product for the decorative market.

RANGE STATEMENT	
Pigment/binder relationships	Pigment binder relationships include: • specific gravity • weight and volume solids • Pigment/Binder ratio • Pigment Volume Concentration (PVC)
Application methods	Application methods include: • brush • spray • roller.
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: • manufacturing instructions • work instructions • batch cards • OHS procedures • test methods.
Problems	Typical process and product problems may include: • incorrect equipment • incorrect raw materials • inadequate ventilation when manufacturing • inability to meet customer specifications • inadequate quality control tests
Variables	Key variables to be monitored include: • substrates • physical properties • cost of raw materials • application methods • curing conditions • drying times
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS753A Develop a non-decorative coating or ink

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the identification of the key requirements for the formulation and manufacture of non-decorative coatings and the transfer of customer needs into appropriate formulations. This competency would typically be required by a person with a technical background needing to acquire knowledge and skills in the surface coatings manufacture and applications area.

Application of the Unit

Application of the unit	This competency applies to technicians, senior technical officers, laboratory supervisors and research and development personnel requiring a firm foundation in the correct use of raw materials for surface coatings. It includes: • formulating appropriate formulas for decorative coatings. • identifying and recognising application methods. • formulating to specified manufacturing parameters. • developing formulas to appropriate manufacturing methods. • ensuring that formulated products meet critical formulation parameters • understanding the functional properties of raw materials and the chemistry of their mixtures • cost variables • identifying toxic/hazardous raw materials and their relevant use • correctly selecting test procedures to ensure product conformance to required specification.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Formulate a decorative coating.	1.1.Determine the effect on performance characteristics of formulation parameters. 1.2.Specify required quality control and performance tests 1.3.Recommend appropriate raw materials 1.4.Recommend appropriate raw material suppliers 1.5.Formulate an industrial coating/ink to specified parameters. 1.6.Ensure laboratory formulations are converted to production scale.
2. Specify the relationship of pigment/binder for a coating.	2.1.Define pigment/binder relationships and their impact on coating properties. 2.2.Calculate Pigment/Binder ratio, Pigment Volume Concentration (PVC) 2.3.Specify pigment/binder relationships appropriate for a coating.
3. Recommend a method of	3.1.Identify critical formulation parameters and the

ELEMENT	PERFORMANCE CRITERIA
manufacture.	effect on manufacturing characteristics for industrial coatings/inks. 3.2.Determine dispersion, let down and mixing required. 3.3.Select the types of equipment required for coating manufacture 3.4.Recommend a method of manufacture.
4. Identify and control hazards.	4.1.Identify material hazards. 4.2.Identify regulatory requirements. 4.3.Identify other hazards from the manufacture of non-decorative coatings/inks 4.4.Recommend appropriate hazard control.
5. Recommend a coating application method.	5.1.Distinguish between common non-decorative coating/ink application methods 5.2.Recommend an application method for non-decorative coatings/ink.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
This competency includes the following skills: • analysis • selection • discrimination • maths
Required knowledge
Competence in this unit includes the following knowledge: • select appropriate raw materials and have knowledge of their chemistry • select appropriate manufacturing equipment based on their principles of operation • formulation parameters • automotive paints requirements • inks formulation • powder and marine coating formulation

REQUIRED SKILLS AND KNOWLEDGE

- costs
- PVC and optical and mechanical properties
- flow point curves
- MSDSs
- toxicity and other hazards of raw materials
- other OHS requirements
- maintenance of records to substantiate and justify chosen formulations
- the role of the formulator
- the function of raw materials
- selection of appropriate raw materials
- impact of differing raw material suppliers
- principles of dispersion, let down and mixing
- identify the different types of equipment used for coating manufacture
- establishment of the specification of the product to be formulated
- establishment of the manufacturing procedure that will convert the selected raw materials into the specified product on a production scale.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of

EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant. Competence must be demonstrated in the ability to formulate an appropriate surface coating using correct raw materials. In particular: • formulate a non-decorative coating to customer requirement • formulate to a cost benefit • manufacture using appropriate equipment • selection of appropriate test methods • makes recommendations to improve formula
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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	
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 italicized 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.	
Codes of practice/	Where reference is made to industry codes of practice, and/or

RANGE STATEMENT	
standards	Australian/international standards, the latest version must be used.
Context	This competency applies to the practical techniques used by the formulator in the selection of raw materials and their correct combination to develop a new product for the non-decorative market.
Pigment/binder relationships	Pigment binder relationships include: • specific gravity • weight and volume solids • Pigment/Binder ratio • Pigment Volume Concentration (PVC)
Application methods	Application methods include: • brush • spray • roller • dipping • curtain coating • print roll • ink jet/bubble.
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: • manufacturing instructions • work instructions • batch cards • OHS procedures • test methods
Problems	Typical process and product problems may include: • incorrect equipment • incorrect raw materials • inadequate ventilation when manufacturing • unable to meet customer's specifications • inadequate quality control tests
Variables	Key variables to be monitored include: • substrates • physical properties • cost of raw materials

RANGE STATEMENT	
	• application methods • curing conditions • drying times
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMAOPS755A Provide surface coatings application advice

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the understanding of application techniques so that advice can be given to coatings customers on the various application methods and what system is most suited to their needs. This competency would typically be required by a person with a technical background needing to acquire knowledge and skills in the surface coatings manufacture and applications area.

Application of the Unit

Application of the unit	This competency applies to paint technologists, technical service personnel, research and development personnel requiring information on the correct application methods for various coatings. It includes: • application techniques • rheology of the coating • formulation considerations • surface preparation • customer requirements • OHS • identification of paint defects

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Match coating to substrate.	1.1. Identify substrate to be used. 1.2. Determine requirements of final coated surface. 1.3. Recommend appropriate coating system.
2. Recommend preparation and application techniques.	2.1. Recommend substrate preparation. 2.2. Select appropriate coating application equipment 2.3. Determine required rheology of coating 2.4. Specify required coating tests 2.5. Specify coating application
3. Analyse problems with surface coatings.	3.1. Identify non-conformances in coated product 3.2. Distinguish between preparation, application and paint problems 3.3. Recommend correct preparation and application to prevent problems.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

This competency includes the following skills:

- analysis
- selection
- discrimination
- maths

Required knowledge

Competence in this unit includes the following knowledge:

- Material Safety Data Sheet
- OHS requirements
- calculate VOC levels
- different types of application equipment - brush, roller, paint pad, various spray applications, electrostatic, dip, hot melt, flow coating, powder coating,
- reasons for prevention of corrosion
- methods used to prepare common substrates for application of a coating
- knowledge of atmospheric conditions ie temperature, humidity and dew point
- identify substrate coating surface defects
- methods than can be used to prevent paint defects in both wet and dry film defects
- explain the different types of test procedures and test equipment
- impact of the final coating if substrate preparation not adequate
- identification of appropriate substrates and their uses
- reasons for the selection of coatings on the customer substrate
- identify the reasons for different types of application equipment
- problems that may arise if incorrect equipment is recommended
- the reasons for compliance coatings
- issues surrounding volatile organic compounds(VOC)
- problems that may arise if incorrect coating is recommended
- effects of shear in surface coatings
- characteristics of shear rates and their importance in coating application
- the effect of rheology on surface coatings
- adequate tests and equipment to identify correct rheological properties
- differing types of paint defects - dry paint films/wet films
- the correct preparation
- the potential effects of climate and other environmental influences on both the coating and substrate

REQUIRED SKILLS AND KNOWLEDGE

- decorative requirements such as colour, gloss and texture
- the customer requirements
- specific service conditions such as impact, abrasion and general wear and tear and their affect on the final coating.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Consistent performance should be demonstrated. In particular look to see that:

- paint defects can be identified and corrected
- correct selection of the coating to the required substrate
- implement correct equipment for the required application

EVIDENCE GUIDE	
	• maintain a safe working environment • assess problem situations and initiate effective corrective action • the many types of application methods
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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	
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 italicized 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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used. Particular standards of relevance include: • AS 2311 "Painting of Buildings" • AS1580 "Paints & related materials-test methods" • AS 2310 "Glossary of Paint and Painting Terms" • AS 3978 "Non destructive testing-visual inspection of metal products and components" • AS 3894 Site testing of protective coatings"
Context	This competency applies to technical staff to provide the correct advice to

RANGE STATEMENT	
	customers for the application of surface coatings to required substrates.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASMELT260B Form carbon anodes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who are required to operate the carbon anode forming process in the production of carbon anodes used in the aluminium smelting process.

Application of the Unit

Application of the unit	This competency unit typically covers items of equipment, such as: - carbon paste preparation, heating, mixing and delivery - carbon anode forming equipment - carbon anode cooling system - ancillary equipment, such as heating systems, scrubbers and fans - conveyors, power and free The plant technician would: - monitor the carbon anode forming process - operate materials handling equipment - recognise and respond to 'out-of-parameter' issues - respond to emergency situations - identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards 1.3. Ensure appropriate authorisations have been obtained/issued 1.4. Identify work flow path (interruptions or bottlenecks) blockage
2. Conduct pre-start requirements to procedures.	2.1. Conduct routine pre-start equipment checks 2.2. Conduct isolation as appropriate for pre-start inspections 2.3. Prepare equipment for operation 2.4. Complete routine equipment checklists 2.5. Complete reports as required for equipment inspections.
3. Conduct operations to procedures.	3.1. Start up carbon anode forming equipment 3.2. Monitor equipment operation and check operational

ELEMENT	PERFORMANCE CRITERIA
	variables are within parameters. 3.3. Verify equipment performance throughout the process 3.4. Apply operating principles to resolve identified problems and take appropriate action 3.5. Shut down carbon anode forming equipment as required 3.6. Conduct routine housekeeping activities 3.7. Complete records as required for equipment operation and performance.
4. Isolate and de-isolate plant	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Competence includes responding to emergency situations such as:

- evacuation due to fire
- loss of power
- excessive emissions of fumes or particulate
- equipment failure
- recognising hazards associated with HTF, tar, pitch, suspended loads and heat stress.

Troubleshooting a range of problems which could include:

- paste mixers

REQUIRED SKILLS AND KNOWLEDGE

- anode formers
- anode cooling
- equipment cooling
- conveyors
- equipment failure.

Required knowledge

Competence includes a comprehensive understanding of the green carbon process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements (eg CTPV)

and knowledge of:

- all items on a schematic of the paste preparation and carbon anode forming process and describe the function of each
- basic principles of operation of main equipment items, including proportioning, dry mix preheating, mixing/heating, carbon anode forming and carbon anode cooling
- basic physics of operation, including effects of temperature, pressure and impurities on the green carbon anode quality
- basic understanding of the product specifications and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which

EVIDENCE GUIDE

	will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this competency unit (eg Elements 2, 5). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • emergency responses are known • hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job • early warning signs of equipment/processes needing attention or with potential problems are recognised, ie monitoring systems in the carbon anode forming process, including equipment, material handling systems and mobile equipment. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

EVIDENCE GUIDE	
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units. This competency may be assessed in conjunction with: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>TDTD1097B Operate a forklift.</i> Other units which are relevant to the job.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Emergency responses	Emergency responses include those related to:

RANGE STATEMENT	
	• evacuation due to fire • loss of power • excessive emissions of fumes or particulate • major oil spill • equipment failure
Equipment and tools	Equipment and tools may include: • hand tools • harnesses and slings • materials handling equipment.
Hazards	Hazards may include: • heat (burns, dehydration and heat stress) • energy sources, eg hydraulic, pneumatic and electric • high pressure piping and valves • pinch and crush points • moisture • banned items • mobile equipment and pedestrian interaction • suspended loads and roller conveyors • hazardous materials, eg heat transfer fluid (HTF), tar and pitch, coal tar pitch volatiles (CTPV).
Hazard control measures	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment.
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.
Instrument/electrical systems	Instrument/electrical systems may include: • emergency shutdown systems • fire systems • pressure and temperature control systems • communications systems • utility systems.
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.

RANGE STATEMENT	
Monitoring systems	Monitoring systems in the carbon anode forming process may include: • monitoring bearing lubrication • monitoring pre-heat distribution of the anode • monitoring moisture content of the anode • monitoring strainers on the anode cooling system • monitoring the cooling tower • monitoring anode forming • mobile equipment condition • checks on pitch pump, paste mixer and cleaning discharge for irregularities • monitoring paste build-up on scale doors, cover weight and mould seals • vacuum former failure • monitoring abnormal trends in the operation of equipment or product specification • screens, samplers, grates, grids, fume scrubbers, weight feeders, and dust collection systems.
Monitor and adjust operational variations	Monitor and adjust operational variations using troubleshooting techniques may refer to the use of: • historical data and records of common faults • troubleshooting lists and directives • site procedures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Out-of-parameter issues	Out-of-parameter issues, faults and problems may include: • out-of-parameter operation or product • fluctuation in temperature, power consumption or product

RANGE STATEMENT	
	movement. • vibe plate distribution and cleaning • inspections on the compaction station • blocked strainers on the anode cooling system • paste belt irregularities • anode cooling system not operating properly. • jam-ups on power and free conveyors • instruments and equipment requiring cleaning • equipment mechanical and electrical problems • flow path blockages • out-of-parameter emissions • unavailability of equipment, personnel or material.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.
Reports	Reports and records may include: • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • computer readouts locally or in the control room • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality inspection reports of the product.
Shutdown procedures	Shut down procedure must follow equipment and site authorised checklist and may include: • communication to supply and delivery areas • communication to impacting areas • obtaining appropriate authorisations • rescheduling operations • liaison with maintenance teams.
Start-up procedures	Start-up procedure will conform to site procedure and include: • safety and pre-start checks • accessing shift logs and equipment records

RANGE STATEMENT	
	• pre-shift briefing information • records and reports from the previous shift.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures, eg spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASMELT261B Bake carbon anodes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who are required to operate the carbon bake processes in the production of carbon anodes used in the aluminium smelting process.

Application of the Unit

Application of the unit	This competency unit typically covers items of equipment, such as: • carbon anode furnace • ancillary equipment, such as scrubbers and fans • conveyors • cranes (may require <i>PMASUP237B Undertake crane, dogging and load transfer operations</i>) • mobile equipment, such as scissor lifts, forklifts and front-end loaders (may require other competencies, eg <i>TDTD1097B Operate a forklift for licensed load shifting</i> or <i>MSAPMSUP205A Transfer loads for unlicensed load shifting</i>). The plant technician would: • monitor the carbon bake process • prepare and conduct fire change • change thermocouples • monitor furnace refractory condition • inspect scrubbers • operate materials handling equipment • recognise and respond to 'out-of-parameter' issues • respond to emergency situations • identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and

	cooperating with other members of the team. This unit does not require the operation of a central control panel

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards 1.3. Ensure appropriate authorisations have been obtained/issued 1.4. Identify work flow path blockages (interruptions or bottlenecks).
2. Conduct pre-start	2.1. Conduct routine pre-start equipment checks

ELEMENT	PERFORMANCE CRITERIA
requirements to procedures.	2.2. Conduct isolation as appropriate for pre-start inspections 2.3. Prepare equipment for operation 2.4. Complete routine equipment checklists 2.5. Complete reports as required for equipment inspections.
3. Conduct carbon bake operations to procedures.	3.1. Start up anode bake and ancillary equipment 3.2. Monitor equipment operation and check operational variables are within parameters. 3.3. Verify equipment performance throughout the process 3.4. Apply operating principles to identify problems and take appropriate action 3.5. Shut down anode bake and ancillary equipment as required 3.6. Conduct routine housekeeping activities 3.7. Complete records as required for equipment operation and performance.
4. Isolate and de-isolate plant	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving

Competence includes responding to emergency situations such as:

REQUIRED SKILLS AND KNOWLEDGE

- open furnace pits
- ring main risers
- fire shaft pit
- riser shaft
- natural gas usage
- rain and water in electrical ducts
- explosions due to loss of draft
- evacuation due to fire
- loss of power
- excessive emissions of fumes or particulate
- equipment failure
- recognising hazards associated with reactive alumina, tar, pitch, kaowool, suspended loads and heat stress.

Troubleshooting a range of problems which could include:

- anode baking equipment
- anode stacker cranes
- conveyors
- rotators
- burner tips
- port plates
- equipment failure.

Required knowledge

Competence includes a comprehensive understanding of the carbon bake process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements

and knowledge of:

- all items on a schematic of the carbon bake process and the function of each
- basic principles of operation of main equipment items, including scrubbers, port plates, thermocouples and burner tips
- basic physics of operation, including effects of temperature, conveyor speed and time on anode quality
- basic understanding of the product specifications and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for timely assessment of parts of this competency unit (eg Elements 2, 5). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- emergency responses are known
- hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job
- early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the carbon anode baking process, including equipment, material handling systems and mobile equipment.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past

EVIDENCE GUIDE	
	incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units. This competency may be assessed in conjunction with: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>PMASUP237B Undertake crane, dogging and load transfer operations</i> • <i>TDTD1097B Operate a forklift</i> • <i>MSAPMSUP205A Transfer loads</i> or other units which are relevant to the job.
Guidance information for assessment	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	
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.	
Codes of practice/	Where reference is made to industry codes of practice, and/or

RANGE STATEMENT	
standards	Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Emergency responses	Emergency responses include those related to: • rain and water in electrical ducts • explosions due to loss of draft • evacuation due to fire • loss of power • excessive emissions of fumes or particulates • equipment failure • leaks/loss of containment • equipment failure • hazards and incidents, site safety procedures • flow path blockages • authorisations and communication processes for normal and emergency situations must follow site procedure
Equipment and tools	Equipment and tools may include: • hand tools • harnesses and slings • materials handling equipment.
Hazards	Hazards may include: • open furnace pits, ring main risers, fire shaft pit, riser shaft, natural gas • heat (burns, dehydration and heat stress) • energy sources, eg hydraulic, pneumatic and electric • high pressure piping and valves • pinch and crush points • moisture • banned items • mobile equipment and pedestrian interaction • furnace emissions

RANGE STATEMENT	
	• suspended loads and roller conveyors • hazardous materials, eg reactive alumina, kaowool, tar and pitch • molten materials.
Hazard control measures	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.
Instrument/electrical systems	Instrument/electrical systems may include: • emergency shutdown systems • fire systems • pressure and temperature control systems • communications systems • utility systems.
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.
Monitor and adjust operational variations	Monitor and adjust operational variations using troubleshooting techniques may refer to the use of: • historical data and records of common faults • troubleshooting lists and directives • site procedures.
Out-of-parameter issues	Out-of-parameter issues, faults and problems may include: • temperature and oxygen fluctuations • production line speed variations • variation of product specification on the input and output side • electrical problems • instruments and equipment requiring cleaning • equipment mechanical problems • flow path blockages • out-of-parameter emissions • unavailability of equipment, personnel or material.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may

RANGE STATEMENT	
	include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.
Reports and records	Reports and records may include: • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • computer readouts locally or in the control room • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality inspection reports of the product.
Shutdown procedures	Shut down procedure must follow equipment and site authorised checklist and may include • communication to supply and delivery areas • communication to impacting areas • obtaining appropriate authorisations • rescheduling operations • liaison with maintenance teams.
Start up procedures	Start up procedure will conform to site procedure and include: • safety and pre-start checks • accessing shift logs and equipment records

RANGE STATEMENT	
	• pre-shift briefing information • records and reports from the previous shift.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures, eg spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMASMELT262B Clean and strip anode rods

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who operate equipment to clean and strip the spent carbon anodes from the anode rods used in the aluminium smelting process.

Application of the Unit

Application of the unit	This competency unit typically covers items of equipment, such as: • carbon anode cleaning equipment (bath removal) • carbon anode stripping equipment, including presses • rod stripping equipment (removal of iron thimbles) • rod cleaning equipment, including shot blasting • rod reject process • conveyors, power and free • cranes (may require <i>PMASUP237B Undertake crane, dogging and load transfer operations</i>) The plant technician would: • operate the anode stripping and rod cleaning equipment • operate materials handling equipment • recognise and respond to 'out-of-parameter' issues • respond to emergency situations • identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards 1.3. Ensure appropriate authorisations have been obtained/issued 1.4. Identify work flow path blockages (interruptions or bottlenecks).
2. Conduct pre-start requirements to procedures.	2.1. Conduct routine pre-start equipment checks 2.2. Conduct isolation as appropriate for pre-start inspections 2.3. Prepare equipment for operation 2.4. Complete routine equipment checklists 2.5. Complete reports as required for equipment

ELEMENT	PERFORMANCE CRITERIA
	inspections.
3. Conduct anode rod stripping and cleaning operations to procedures.	3.1. Start up anode stripping equipment 3.2. Monitor equipment operation and check operational variables are within parameters. 3.3. Verify equipment performance throughout the process 3.4. Apply operating principles to identify problems and take appropriate action 3.5. Shut down anode stripping equipment as required 3.6. Conduct routine housekeeping activities 3.7. Complete records as required for equipment operation and performance.
4. Isolate and de-isolate plant	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Competence includes responding to emergency situations such as:

evacuation due to fire

- loss of power
- excessive emissions of fumes or particulate
- equipment failure
- recognising hazards associated with reactive alumina, tar, pitch, kaowool, suspended loads

REQUIRED SKILLS AND KNOWLEDGE

and heat stress.

Troubleshooting a range of problems which could include:

- anode cleaning machines
- anode stacker cranes
- conveyors
- rotators
- equipment failure.

Required knowledge

Competence includes a comprehensive understanding of the anode stripping and rod cleaning process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements

and knowledge of:

- all items on a schematic of the anode stripping and rod cleaning process and the function of each
- basic principles of operation of main equipment items including:
 - bath removal
 - carbon anode removal
 - cast iron removal
 - rod cleaning
 - reject rod process
- basic understanding of the product specifications, including cleanliness and residue, and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic

EVIDENCE GUIDE

	a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this competency unit (eg Elements 2, 5). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • emergency responses are known. • hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job. • early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the clean and strip anode process including equipment, material handling systems and mobile equipment. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will

EVIDENCE GUIDE	
	be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units. This competency may be assessed in conjunction with: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>PMASUP237B Undertake crane, dogging and load transfer operations</i> • <i>TDTD1097B Operate a forklift</i> • <i>MSAPMSUP205A Transfer loads</i> Other units which are relevant to the job.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has

RANGE STATEMENT	
	occurred reporting problems outside area of responsibility to designated person.
Emergency responses	Emergency responses include those related to: - evacuation due to fire - loss of power - excessive emissions of fumes or particulate - major oil spill - equipment failure
Equipment and tools	Equipment and tools may include: - hand tools - harnesses and slings - materials handling equipment.
Hazards	Hazards may include: - heat (burns, dehydration and heat stress) - energy sources, eg hydraulic, pneumatic and electric - high pressure piping and valves - pinch and crush points - banned items - mobile equipment and pedestrian interaction - suspended loads and conveyors - hazardous materials, eg bath and carbon dust.
Hazard control methods	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.
Instrument/electrical systems	Instrument/electrical systems may include: - emergency shutdown systems - fire systems - communications systems - utility systems.
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site

RANGE STATEMENT	
	procedure.
Monitoring systems	Monitoring systems in the anode stripping area may include: • monitoring the operation of anode stripping and rod cleaning equipment • monitoring the effectiveness of each process • ensuring removed material is not blocking up • monitoring conveyors, drag chains and lines • mobile equipment condition • monitoring abnormal trends in the operation of equipment or product specification.
Monitor and adjust operational variations	Monitor and adjust operational variations using troubleshooting techniques may refer to the use of: • historical data and records of common faults • troubleshooting lists and directives • site procedures.
Out-of-parameter issues	Out-of-parameter issues, faults and problems may include: • out-of-parameter operation or product • fluctuation in temperature, power consumption or product movement. • instruments and equipment requiring cleaning • equipment mechanical and electrical problems • flow path blockages • out-of-parameter emissions • unavailability of equipment, personnel or material.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes

RANGE STATEMENT	
	• batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Reports and records	Reports and records may include: • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality inspection reports of the product.
Start up procedures	Start up procedure will conform to site procedure and include: • safety and pre-start checks • accessing shift logs and equipment records • pre-shift briefing information • records and reports from the previous shift.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures, eg spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASMELT263B Spray carbon anodes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who operate equipment to spray aluminium on carbon anodes used in the aluminium smelting process.

Application of the Unit

Application of the unit	This competency unit typically covers items of equipment, such as: • carbon anode aluminium spray station • molten aluminium delivery • conveyors, power and free • aluminium melting furnace (may require <i>MEM04001B Operate melting furnaces</i>) • cranes (may require <i>PMASUP237B Undertake crane, dogging and load transfer operations</i>) The plant technician would: • operate the aluminium spray station • operate molten aluminium delivery system • recognise and respond to 'out-of-parameter' issues • respond to emergency situations • identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards 1.3. Ensure appropriate authorisations have been obtained/issued 1.4. Identify work flow path blockages (interruptions or bottlenecks)
2. Conduct pre-start requirements to procedures.	2.1. Conduct routine pre-start equipment checks 2.2. Conduct isolation as appropriate for pre-start inspections 2.3. Prepare equipment for operation 2.4. Complete routine equipment checklists 2.5. Complete reports as required for equipment

ELEMENT	PERFORMANCE CRITERIA
	inspections.
3. Conduct operations to procedures.	3.1. Start up aluminium spray station equipment 3.2. Monitor equipment operation and check operational variables are within parameters. 3.3. Verify equipment performance throughout the process 3.4. Apply operating principles to identify problems and take appropriate action 3.5. Shut down aluminium spray station equipment as required 3.6. Conduct routine housekeeping activities 3.7. Complete records as required for equipment operation and performance.
4. Isolate and de-isolate plant	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Competence includes responding to emergency situations such as:

- evacuation due to fire
- loss of power
- excessive emissions of fumes or particulate
- equipment failure
- recognising hazards associated with reactive alumina, tar, pitch, kaowool, suspended loads

REQUIRED SKILLS AND KNOWLEDGE

and heat stress.

Troubleshooting a range of problems which could include:

- anode spray equipment
- anode stacker cranes
- conveyors
- rotators
- equipment failure.

Required knowledge

Competence includes a comprehensive understanding of the carbon anode aluminium spray process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements

and knowledge of:

- all items on a schematic of the carbon anode aluminium spray station process and the function of each
- basic principles of operation of main equipment items, including molten aluminium delivery, power and free conveyors, spray station
- basic understanding of the product specifications, including depth of cover and uniformity of aluminium layer, and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

EVIDENCE GUIDE	
	Simulation may be required to allow for timely assessment of parts of this competency unit (eg Elements 2, 5). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • emergency responses are known. • hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job. • early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the carbon anode spraying process including equipment, material handling systems and mobile equipment. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit

EVIDENCE GUIDE	
	concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units. This competency may be assessed in conjunction with: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>PMASUP237A Undertake crane, dogging and load transfer operations</i> • <i>TDTD1097B Operate a forklift</i> • <i>MSAPMSUP205A Transfer loads</i> Other units which are relevant to the job.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.

RANGE STATEMENT	
Emergency responses	Emergency responses include those related to: • evacuation due to fire • loss of power • excessive emissions of fumes or particulate • major oil spill • equipment failure
Equipment and tools	Equipment and tools may include: • hand tools • harnesses • crucible transport equipment • EWE • forklift • furnace tending vehicle • other materials handling equipment (fixed and mobile).
Hazards	Hazards may include: • heat (burns, dehydration and heat stress) • energy sources, eg hydraulic, pneumatic and electric • high pressure piping and valves • pinch and crush points • moisture • banned items • mobile equipment and pedestrian interaction • suspended loads and roller conveyors • hazardous materials, eg reactive alumina, kaowool, tar and pitch • molten materials.
Hazard control methods	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.
Instrument/electrical systems	Instrument/electrical systems may include: • emergency shutdown systems • fire systems • pressure and temperature control systems • communications systems

RANGE STATEMENT	
	• utility systems.
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.
Monitoring systems	Monitoring systems may include: • monitoring the operation of crucibles, crucible transport equipment, furnaces • monitoring the effectiveness of the process • monitoring abnormal trends in the operation of equipment or product specification.
Monitor and adjust operational variations	Monitor and adjust operational variations using troubleshooting techniques may refer to the use of: • historical data and records of common faults • troubleshooting lists and directives • site procedures.
Out-of-parameter issues	Out-of-parameter issues, faults and problems may include: • out-of-parameter operation or product • fluctuation in temperature, power consumption or product movement. • instruments and equipment requiring cleaning • equipment mechanical and electrical problems • flow path blockages • out-of-parameter emissions • unavailability of equipment, personnel or material.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures

RANGE STATEMENT	
	• formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Shutdown procedures	Shut down procedure must follow equipment and site authorised checklist and may include • communication to supply and delivery areas • communication to impacting areas • obtaining appropriate authorisations • rescheduling operations • liaison with maintenance teams.
Reports and records	Reports and records may include: • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • analysis of furnace metal specifications • computer readouts locally or in the control room • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality sample records of the product.
Start up procedures	Start up procedure will conform to site procedure and include: • safety and pre-start checks • accessing shift logs and equipment records • pre-shift briefing information • records and reports from the previous shift.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

RANGE STATEMENT

Persons are required to have skills in hazard identification, assessment and application of control measures, eg spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASMELT264B Start up reduction cells

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who bake out and start up reduction cells used in the aluminium smelting process.

Application of the Unit

Application of the unit	Typically the reduction cells would be started up after refurbishment or repair and may have a new cathode lining. This competency unit typically covers items of equipment, such as: • reduction cell (pot) • carbon anodes • bake out equipment • cell tending equipment (may require <i>PMASUP237B Undertake crane, dogging and load transfer operations</i>) The plant technician would: • prepare the refurbished or repaired cell for start up • bake out the cathode lining • start up the cell, including transfer of bath • monitor the performance of the cell, ready for operation • recognise and respond to 'out-of-parameter' issues • respond to emergency situations • identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards 1.3. Ensure appropriate authorisations have been obtained/issued 1.4. Identify work flow path (interruptions or bottlenecks) blockage
2. Conduct pre-start requirements to procedures.	2.1. Conduct routine pre-start equipment checks 2.2. Conduct isolation as appropriate for pre-start inspections 2.3. Prepare equipment for operation 2.4. Complete routine equipment checklists 2.5. Complete reports as required for equipment

ELEMENT	PERFORMANCE CRITERIA
	inspections.
3. Start up reduction cell to procedures.	3.1. Start up reduction cell 3.2. Monitor equipment operation and check operational variables are within parameters. 3.3. Verify equipment performance throughout the process 3.4. Apply operating principles to identify problems and take appropriate action 3.5. Shut down reduction cell as required 3.6. Conduct routine housekeeping activities 3.7. Complete records as required for equipment operation and performance.
4. Isolate and de-isolate plant	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Competence includes responding to emergency situations such as:

- tap outs
- evacuation due to fire
- loss of power
- excessive emissions of fumes or particulate
- equipment failure
- recognising hazards associated with electromagnetic effects, moisture, wet bath and wet

REQUIRED SKILLS AND KNOWLEDGE

soda ash.

Troubleshooting a range of problems which could include or be related to:

- electrical faults
- interpreting information from process control system
- equipment failure
- cell instability
- feeder problems
- anode effect poles
- metal tapping
- bath tapping
- beam height
- anodes
- current draw
- materials handling systems
- bake process
- loading anodes and anode effect.

Required knowledge

Competence includes a comprehensive understanding of the reduction cell process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements (eg CTPV)

and knowledge of:

- all items on a schematic of the reduction cell process and the function of each
- basic principles of operation of main equipment items, including cathode bed, anodes and adjusters, feeders, bath conditions, current distribution
- basic understanding of the product specifications, including depth of cover and uniformity of aluminium layer, and variations required on the input and output side
- basic understanding of the bake process (gas bake or resistor bake)
- understanding of the cell preparation process, including cathode bed, thermocouples, feeders, fittings and connections, bake process, anode installation, bath transfer, shunt removal
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for timely assessment of parts of this competency unit (eg Elements 2, 5). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster:

- emergency responses are known
- hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the reduction cell process, including equipment, material handling systems and mobile equipment.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar

EVIDENCE GUIDE	
	sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units. This competency may be assessed in conjunction with: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>MSAPMSUP205A Transfer loads</i> Other units which are relevant to the job.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action

RANGE STATEMENT	
	• determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Emergency responses	Emergency responses include those related to: • leak/loss of containment • evacuation due to fire or open cell circuit • loss of power • excessive emissions of fumes or particulate • major oil spill • equipment failure
Equipment and tools	Equipment and tools may include: • hand tools • harnesses and slings • materials handling equipment.
Hazards	Hazards may include: • heat (burns, dehydration and heat stress) • energy sources, eg hydraulic, pneumatic and electric • electro magnetic effects • high pressure piping and valves • pinch and crush points • moisture • banned items • mobile equipment and pedestrian interaction • suspended loads and roller conveyors • hazardous materials, eg reactive alumina, kaowool, tar and pitch • molten materials.
Hazard control methods	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.

RANGE STATEMENT	
Instrument/electrical systems	Instrument/electrical systems may include: • bake out equipment • emergency shutdown systems • fire systems • pressure and temperature control systems • communications systems • utility systems.
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.
Monitoring systems	Monitoring systems may include: • monitoring the operation of reduction cell • monitoring the effectiveness of the process • condition of the bath • monitoring abnormal trends in the operation of equipment or product specification.
Monitor and adjust operational variations	• Monitor and adjust operational variations using troubleshooting techniques may refer to the use of: • historical data and records of common faults • troubleshooting lists and directives • site procedures.
Out-of-parameter issues	Out-of-parameter issues, faults and problems may include: • tap out • out-of-parameter operation or product • fluctuation in temperature, power consumption or product movement. • instruments and equipment requiring cleaning • equipment mechanical and electrical problems • flow path blockages • out-of-parameter emissions • unavailability of equipment, personnel or material.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.

RANGE STATEMENT	
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Shutdown procedures	Shut down procedure must follow equipment and site authorised checklist and may include: • communication to supply and delivery areas • communication to impacting areas • obtaining appropriate authorisations • rescheduling operations • liaison with maintenance teams.
Reports and records	Reports and records may include: • computer readouts locally or in the control room • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality inspection reports of the product.
Start up procedures	Start up procedure will conform to site procedure and include: • safety and pre-start checks • accessing shift logs and equipment records • pre-shift briefing information • records and reports from the previous shift.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or

RANGE STATEMENT	
	crew leader meetings, toolbox talks and handover details.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures, eg spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASMELT265B Operate reduction cells

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who operate reduction cells for the aluminium smelting process.

Application of the Unit

Application of the unit	Typically the plant technician would monitor and adjust the operation of the cells, including cell maintenance and beam raising activities. This competency unit typically covers items of equipment, such as: • reduction cell (pot) • carbon anodes and beams. • The plant technician would: • monitor and control reduction cell operation • conduct anode setting • change anodes as required • conduct beam raising • shut down cells • recognise and respond to 'out-of-parameter' issues • respond to emergency situations • identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards 1.3. Ensure appropriate authorisations have been obtained/issued 1.4. Identify work flow path (interruptions or bottlenecks) blockage.
2. Operate reduction cell to procedures.	2.1. Monitor equipment operation and check operational variables are within parameters. 2.2. Respond to cell alarms and take appropriate action. 2.3. Verify equipment performance throughout the process 2.4. Apply operating principles to identify problems and take appropriate action 2.5. Shut down reduction cell as required 2.6. Conduct routine housekeeping activities 2.7. Complete records as required for equipment operation and performance.

ELEMENT	PERFORMANCE CRITERIA
3. Conduct cell maintenance activities	3.1. Conduct routine cell maintenance as required 3.2. Conduct beam raising as required and in conjunction with others
4. Isolate and de-isolate plant	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Competence also includes responding to emergency situations such as:

- tap outs
- evacuation due to fire
- loss of power
- excessive emissions of fumes or particulate
- equipment failure
- recognising hazards associated with electromagnetic effects, moisture, wet bath and wet soda ash.

Troubleshooting a range of problems which could include or be related to:

- electrical faults
- interpreting information from process control system
- equipment failure
- cell instability
- feeder problems
- anode effect poles
- metal tapping

REQUIRED SKILLS AND KNOWLEDGE

- bath tapping
- beam height
- anodes
- current draw
- materials handling systems
- bake process
- loading anodes and anode effect.

Required knowledge

Competence includes a comprehensive understanding of the reduction line process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements (eg CTPV)

and knowledge of:

- all items on a schematic of the reduction cell process and the function of each
- basic principles of operation of main equipment items, including cathode bed, anodes and adjusters, feeders, bath conditions, current distribution
- basic understanding of the product specifications, including depth of cover and uniformity of aluminium layer, and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this competency unit (eg

EVIDENCE GUIDE	
	Elements 2, 5). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • emergency responses are known. • hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job. • early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the reduction cell process including equipment, material handling systems and mobile equipment. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with

EVIDENCE GUIDE	
	other relevant units. This competency may be assessed in conjunction with: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>MSAPMSUP205A Transfer loads</i> Other units which are relevant to the job.
Guidance information for assessment	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	
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 italicized 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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Cell maintenance	Reduction cell maintenance activities includes: • adjusting bath cover • housekeeping • ensuring covers, safety equipment and guards are in place

RANGE STATEMENT	
Emergency responses	Emergency responses include those related to: • leak/loss of containment • evacuation due to fire or open circuit cell • loss of power • excessive emissions of fumes or particulate • major oil spill • equipment failure
Equipment and tools	Equipment and tools may include: • hand tools • harnesses and slings • materials handling equipment.
Hazards	Hazards may include: • heat (burns, dehydration and heat stress) • energy sources, eg hydraulic, pneumatic and electric • electro magnetic effects • high pressure piping and valves • pinch and crush points • moisture • banned items • mobile equipment and pedestrian interaction • suspended loads and roller conveyors • hazardous materials, eg reactive alumina, kaowool, tar and pitch • molten materials.
Hazard control methods	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment.
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.
Instrument/electrical systems	Instrument/electrical systems may include: • emergency shutdown systems • fire systems • pressure and temperature control systems • communications systems • utility systems.

RANGE STATEMENT	
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.
Monitoring systems	Monitoring systems may include: • monitoring the operation of reduction cell • monitoring the effectiveness of the process • condition of the bath. • monitor abnormal trends in the operation of equipment or product specification.
Monitor and adjust operational variations	Monitor and adjust operational variations using troubleshooting techniques may refer to the use of: • historical data and records of common faults • troubleshooting lists and directives • site procedures.
Out-of-parameter issues	Out-of-parameter issues, faults and problems may include: • tap out • out-of-parameter operation or product • fluctuation in temperature, power consumption or product movement. • instruments and equipment requiring cleaning • equipment mechanical and electrical problems • flow path blockages • out-of-parameter emissions • unavailability of equipment, personnel or material.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures

RANGE STATEMENT	
	• formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Shutdown procedures	Shut down procedure must follow equipment and site authorised checklist and may include • communication to supply and delivery areas • communication to impacting areas • obtaining appropriate authorisations • rescheduling operations • liaison with maintenance teams.
Reports and records	Reports and records may include: • computer readouts locally or in the control room • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality inspection reports of the product.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures, eg spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASMELT266B Deliver molten metal

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who transport molten metal in the aluminium smelting process. Typically the molten aluminium would be moved using mobile transport equipment and crucibles.

Application of the Unit

Application of the unit	This competency unit typically covers items of equipment, such as: • crucibles • siphoning equipment • mobile transporting equipment. The plant technician would: • collect filled crucibles for transportation • move the crucible to required location • transfer/siphon molten aluminium to the destination furnace • recognise and respond to 'out-of-parameter' issues • respond to emergency situations • identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards 1.3. Ensure appropriate authorisations have been obtained/issued
2. Conduct pre-start requirements to procedures.	2.1. Conduct routine pre-start equipment checks 2.2. Conduct isolation as appropriate for pre-start inspections 2.3. Prepare equipment for operation 2.4. Complete routine equipment checklists 2.5. Complete reports as required for equipment inspections.
3. Conduct metal delivery operations to procedures.	3.1. Start up equipment as required 3.2. Monitor equipment operation and check operational variables are within parameters. 3.3. Verify equipment performance throughout the process

ELEMENT	PERFORMANCE CRITERIA
	3.4. Apply operating principles to resolve identified problems and take appropriate action 3.5. Shut down equipment as required 3.6. Conduct routine housekeeping activities 3.7. Complete records as required for equipment operation and performance.
4. Isolate and de-isolate plant.	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Competence also includes responding to emergency situations such as:

- evacuation due to fire and chlorine
- loss of power and excessive emissions of fumes or particulate
- major oil spill
- equipment failure
- recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads and hydration and heat stress.

Troubleshooting a range of problems which could include:

- delivery of molten metal
- furnace operation and cleaning problems
- interpreting information on the control system

REQUIRED SKILLS AND KNOWLEDGE

- maintenance system or equipment failure.

Required knowledge

Competence includes a comprehensive understanding of crucibles, transporters and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and housekeeping requirements;

and knowledge of:

- all items on a schematic of the siphon equipment, delivery equipment and the function of each
- basic principles of operation of main equipment items, including siphoning equipment and crucible transport equipment
- basic understanding of the product specifications and variations required on the input and output side
- isolation of equipment
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for timely assessment of parts of this competency unit (eg Elements 2, 5). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • emergency responses are known. • hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job. • early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the metal delivery process including equipment, material handling systems and mobile equipment. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units. This competency may be assessed in conjunction with: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>MSAPMSUP205A Transfer loads</i> Other units which are relevant to the job.

EVIDENCE GUIDE**Guidance information for assessment**

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**

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 if the candidate, accessibility of the item, and local industry and regional contexts.

Codes of practice/ standards

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Appropriate action

Appropriate action includes:

- determining problems needing action
- determining possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility to designated person.

Emergency responses

Emergency responses include those related to:

- leak/loss of containment
- evacuation due to fire or open cell circuit
- loss of power
- excessive emissions of fumes or particulate
- major oil spill
- equipment failure.

Equipment and tools

Equipment and tools may include:

- hand tools
- harnesses and slings
- materials handling equipment.

RANGE STATEMENT	
Hazards	Hazards may include: • heat (burns, dehydration and heat stress) • energy sources, eg hydraulic, pneumatic and electric • electro magnetic effects • high pressure piping and valves • pinch and crush points • moisture • banned items • mobile equipment and pedestrian interaction • suspended loads and roller conveyors • hazardous materials, eg chlorine • molten materials.
Hazard control methods	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.
Instrument/electrical systems	Instrument/electrical systems may include: • emergency shutdown systems • fire systems • pressure and temperature control systems • communications systems • utility systems.
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.
Monitoring systems	Monitoring systems in the spray station area may include: • monitoring the operation of anode spray station equipment • monitoring the effectiveness of the process • ensuring molten aluminium is delivered as required • monitoring conveyors • monitoring abnormal trends in the operation of equipment or product specification.
Monitor and adjust operational variations	• Monitor and adjust operational variations using troubleshooting techniques may refer to the use of:

RANGE STATEMENT	
	- historical data and records of common faults - troubleshooting lists and directives - site procedures.
Out-of-parameter issues	Out-of-parameter issues, faults and problems may include: - delivery of molten metal from reduction cells to clean crucible - pipe failures, eg cracks, blockages - venturi and siphon system failure - siphoning suction equipment failure - out-of-parameter operation or product - fluctuation in temperature, power consumption or product movement - instruments and equipment requiring cleaning - equipment mechanical and electrical problems - flow path blockages - out-of-parameter emissions - unavailability of equipment, personnel or material.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: - all work instructions - standard operating procedures - formulas/recipes - batch sheets - temporary instructions - any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Shutdown procedures	Shut down procedure must follow equipment and site authorised

RANGE STATEMENT	
	checklist and may include: • communication to supply and delivery areas • communication to impacting areas • obtaining appropriate authorisations • rescheduling operations • liaison with maintenance teams.
Reports and records	Reports and records may include: • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality inspection reports of the product.
Start up procedures	Start up procedure will conform to site procedure and include: • safety and pre-start checks • accessing shift logs and equipment records • pre-shift briefing information • records and reports from the previous shift.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures, eg spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASMELT267B Cast aluminium ingots

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who cast aluminium ingots using mould casting methods.

Application of the Unit

Application of the unit	This unit typically covers items of equipment, such as: • tilting furnace • launders • casting moulds and/or casting wheel equipment • stacking and strapping equipment. The plant technician would: • pour molten aluminium from the holding furnace to delivery launders • operate the casting equipment • stack and strap ingots as required • recognise and respond to 'out-of-parameter' issues • respond to emergency situations • identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. If crane use is required, see also <i>PMASUP237B Undertake crane, dogging and load transfer operations</i>. This unit does not require the operation of a central control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards 1.3. Ensure appropriate authorisations have been obtained/issued 1.4. Identify work flow path blockages (interruptions or bottlenecks).
2. Conduct pre-start requirements to procedures.	2.1. Conduct routine pre-start equipment checks 2.2. Conduct isolation as required for pre-start inspections 2.3. Prepare equipment for operation 2.4. Complete routine equipment checklists 2.5. Complete reports as required for equipment

ELEMENT	PERFORMANCE CRITERIA
	inspections.
3. Conduct aluminium casting operations to procedures.	3.1. Start up equipment as required 3.2. Monitor equipment operation and check operational variables are within parameters. 3.3. Verify equipment performance throughout the process 3.4. Apply operating principles to identify problems and take appropriate action 3.5. Shut down equipment as required 3.6. Conduct routine housekeeping activities 3.7. Complete records as required for equipment operation and performance.
4. Isolate and de-isolate plant	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Competence also includes responding to emergency situations such as:

- evacuation due to fire and the escape of chlorine
- loss of power and excessive emissions of fumes or particulate
- major oil spill
- equipment failure
- recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile

REQUIRED SKILLS AND KNOWLEDGE

equipment, hazardous materials, banned items, suspended loads and hydration and heat stress.

Troubleshooting a range of problems which could include:

- casting equipment
- furnace operation
- cleaning problems
- interpreting information on the control system
- maintenance system or equipment failure.

Required knowledge

Competence includes a comprehensive understanding of the casting process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements

and knowledge of:

- all items on a schematic of the metal delivery, casting and ingot stacking equipment and the function of each
- basic principles of operation of main equipment items, including metal delivery, casting and ingot stacking equipment
- basic understanding of the product specifications and variations required on the input and output side
- isolation of equipment
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which

EVIDENCE GUIDE	
	will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this competency unit (eg Elements 2, 5). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • emergency responses are known • hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job • early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the casting process including equipment, material handling systems and mobile equipment. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

EVIDENCE GUIDE	
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units. This competency may be assessed in conjunction with other relevant competencies such as: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>PMASUP237B Undertake crane, dogging and load transfer operations</i> • <i>MSAPMSUP205A Transfer loads.</i> Other units which are relevant to the job.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated

RANGE STATEMENT	
	person.
Emergency responses	Emergency responses include those related to: • leak/loss of containment • evacuation due to fire or open cell circuit • loss of power • excessive emissions of fumes or particulate • major oil spill • equipment failure
Equipment and tools	Equipment and tools may include: • hand tools • slings • materials handling equipment (fixed and mobile).
Hazards	Hazards may include: • heat (burns, dehydration and heat stress) • energy sources, eg hydraulic, pneumatic and electric • high pressure piping and valves • pinch and crush points • moisture • mobile equipment and pedestrian interaction • hazardous materials • furnace and crucible emissions • molten materials.
Hazard control methods	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment.
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.
Instrument/electrical systems	Instrument/electrical systems may include: • emergency shutdown systems • fire systems • pressure and temperature control systems • communications systems • utility systems.
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site

RANGE STATEMENT	
	procedure.
Monitoring systems	Monitoring systems may include: • monitoring the effectiveness of the process • monitoring abnormal trends in the operation of equipment or product specification.
Monitor and adjust operational variations	Monitor and adjust operational variations using troubleshooting techniques may refer to the use of: • historical data and records of common faults • troubleshooting lists and directives • site procedures.
Out-of-parameter issues	Out-of-parameter issues, faults and problems may include: • out-of-parameter operation or product • fluctuation in temperature, air pressure, power consumption or product movement. • instruments and equipment requiring cleaning • equipment mechanical and electrical problems • flow path blockages • out-of-parameter emissions • unavailability of equipment, personnel or material.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also

RANGE STATEMENT	
	includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Shutdown procedures	• Shut down procedure must follow equipment and site authorised checklist and may include: • communication to supply and delivery areas • communication to impacting areas • obtaining appropriate authorisations • rescheduling operations • liaison with maintenance teams.
Reports and records	Reports and records may include: • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • quality sample records • computer read-outs locally or in the control room • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality inspection reports of the product.
Start up procedures	Start up procedure will conform to site procedure and include: • safety and pre-start checks • accessing shift logs and equipment records • pre-shift briefing information • records and reports from the previous shift.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures, eg spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASMELT268B Vertical direct casting

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who cast aluminium using the Vertical Direct Chill Casting process (referred to as Vertical Direct Casting or VDC) used for production of aluminium slabs, billet or T bar, using electrical furnace extrusion technology.

Application of the Unit

Application of the unit	This competency unit typically covers items of equipment, such as: • casting furnace and launders • Vertical Direct Casting equipment, including casting table • billet and T-Bar saws and associated equipment • inspection station homogenisers • mobile transporting equipment. The plant technician may: • deliver molten aluminium from the tilt furnace to the launders and casting equipment • operate the VDC equipment • operate the saw, as required • product inspection, as required • recognise and respond to 'out-of-parameter' issues • respond to emergency situations • identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards 1.3. Ensure appropriate authorisations have been obtained/issued 1.4. Identify work flow path (interruptions or bottlenecks) blockage
2. Conduct pre-start requirements to procedures.	2.1. Conduct routine pre-start equipment checks 2.2. Conduct isolation as appropriate for pre-start inspections 2.3. Prepare equipment for operation 2.4. Complete routine equipment checklists 2.5. Complete reports as required for equipment

ELEMENT	PERFORMANCE CRITERIA
	inspections.
3. Conduct VDC operations to procedures.	3.1. Start up equipment as required 3.2. Monitor equipment operation and check operational variables are within parameters. 3.3. Verify equipment performance throughout the process 3.4. Apply operating principles to identify problems and take appropriate action 3.5. Shut down equipment as required 3.6. Conduct routine housekeeping activities 3.7. Complete records as required for equipment operation and performance.
4. Isolate and de-isolate plant	4.1. Isolate plant 4.2. Make safe for required work 4.3. Check plant is ready to be returned to service 4.4. Prepare plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Competence also includes responding to emergency situations such as:

- evacuation due to fire and the escape of chlorine
- loss of power and excessive emissions of fumes or particulate
- major oil spill
- equipment failure
- recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile

REQUIRED SKILLS AND KNOWLEDGE

equipment, hazardous materials, banned items, suspended loads and hydration and heat stress.

Troubleshooting a range of problems which could include:

- VDC equipment
- launders
- furnace operation
- billet saw
- T-bar saw and cleaning problems
- interpreting information on the control system
- maintenance system or equipment failure.

Required knowledge

Competence includes a comprehensive understanding of the VDC process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements

and knowledge of:

- all items on a schematic of the furnace, launders and VDC equipment and the function of each
- basic principles of operation of main equipment items, including furnace, launders and VDC equipment
- basic understanding of the product specifications and variations required on the input and output side
- understanding of the VDC process
- isolation of equipment
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an

EVIDENCE GUIDE

	operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this competency unit (eg Elements 2, 5). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • emergency responses are known. • hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job. • early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the VDC process including equipment, material handling systems and mobile equipment. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs

EVIDENCE GUIDE	
	will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units. This competency may be assessed in conjunction with: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>PMASUP237B Undertake crane, dogging and load transfer operations</i> • <i>MSAPMSUP205A Transfer loads.</i> Other units which are relevant to the job.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has

RANGE STATEMENT	
	occurred reporting problems outside area of responsibility to designated person.
Emergency responses	Emergency responses include those related to: - leak/loss of containment - evacuation due to fire or open cell circuit - loss of power - excessive emissions of fumes or particulate - major oil spill - equipment failure.
Equipment and tools	Equipment and tools may include: - hand tools - harnesses and slings - materials handling equipment (fixed and mobile).
Hazards	Hazards may include: - heat (burns, dehydration and heat stress) - energy sources, eg hydraulic, pneumatic and electric - high pressure piping and valves - pinch and crush points - moisture - banned items - mobile equipment and pedestrian interaction - suspended loads - hazardous materials - furnace emissions - oxygen and chlorine level fluctuations - molten materials.
Hazard control methods	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.
Instrument/electrical systems	Instrument/electrical systems may include: - emergency shutdown systems - fire systems - pressure and temperature control systems

RANGE STATEMENT	
	- communications systems - utility systems.
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.
Monitoring systems	Monitoring systems may include: - monitoring the operation of the VDC process - monitor the operation of the furnace, whilst casting - monitor the operation of the billet and T-bar saw - monitoring the effectiveness of the process - monitoring abnormal trends in the operation of equipment or product specification.
Monitor and adjust operational variations	Monitor and adjust operational variations using troubleshooting techniques may refer to the use of: - historical data and records of common faults - troubleshooting lists and directives - site procedures.
Out-of-parameter issues	Out-of-parameter issues, faults and problems may include: - delivery of molten metal from furnace - pipe failures, eg cracks, blockages - out-of-parameter operation or product - fluctuation in temperature, air pressure, power consumption or product movement. - instruments and equipment requiring cleaning - equipment mechanical and electrical problems - flow path blockages - out-of-parameter emissions - unavailability of equipment, personnel or material.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.

RANGE STATEMENT	
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Shutdown procedures	Shut down procedure must follow equipment and site authorised checklist and may include: • communication to supply and delivery areas • communication to impacting areas • obtaining appropriate authorisations • rescheduling operations • liaison with maintenance teams.
Reports and records	Reports and records may include: • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • quality sample records • computer read-outs locally or in the control room • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality inspection reports of the product.
Start up procedures	Start up procedure will conform to site procedure and include: • safety and pre-start checks • accessing shift logs and equipment records • pre-shift briefing information • records and reports from the previous shift.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.
Health, safety and	All operations to which this unit applies are subject to stringent

RANGE STATEMENT**environment (HSE)**

health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures, eg spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMASMELT269A Operate cell tending equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who operate cell tending equipment used to adjust and support the operation of reduction cells for the aluminium smelting process.

Application of the Unit

Application of the unit	Typically cell tending equipment comprises a gantry crane with purpose built attachments for reduction beam raising, anode changing, transport and operation of cell tapping crucibles, and feed-hopper delivery of feed and bath materials. Note that the operation of cell tending equipment may require: • <i>PMASUP237B Undertake crane, dogging and load transfer operations</i> • a licence to operate the equipment, depending on State and Federal requirements. In a typical situation, the plant technician would operate cell tending equipment in conjunction with other technicians to support and adjust the operation of the reduction cells, including cell maintenance, beam raising, cell feed and cell tapping activities. This competency unit typically covers items of equipment, such as: • reduction cell (pot) • carbon anodes and beams • cell tending equipment The plant technician would operate cell tending equipment to: • change anodes as required • conduct beam raising • conduct metal tapping • conduct bath tapping • cell feed replenishment • other cell maintenance and crane operations

	- recognise and respond to 'out-of-parameter' issues - respond to emergency situations - identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards

ELEMENT	PERFORMANCE CRITERIA
	1.3.Ensure appropriate authorisations have been obtained/issued 1.4.Identify work flow path (interruptions or bottlenecks) blockage.
2. Conduct pre-start requirements to procedures.	2.1. Conduct routine pre-start equipment checks 2.2. Conduct isolation as appropriate for pre-start inspections 2.3. Prepare equipment for operation 2.4. Complete routine equipment checklists 2.5. Complete reports as required for equipment inspections.
3. Operate cell tending equipment to procedures.	3.1. Start up cell tending equipment and perform start up checks as required 3.2. Conduct beam raising and anode changing as required 3.3. Conduct cell replenishment as required 3.4. Conduct metal tapping as required 3.5. Transfer metal crucibles as required 3.6. Conduct bath tapping as required 3.7. Communicate with others in the reduction cell area
4. Shutdown cell tending equipment	4.1. Manoeuvre equipment to suitable parking position 4.2. Shutdown equipment 4.3. Conduct shutdown checks of equipment 4.4. Complete reports as required

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis

REQUIRED SKILLS AND KNOWLEDGE

- completing plant records
- communication
- problem solving.

Competence also includes responding to emergency situations such as:

- tap outs
- evacuation due to fire
- loss of power and excessive emissions of fumes or particulate
- equipment failure
- recognising hazards associated with electromagnetic effects, moisture, wet bath and wet soda ash.

Troubleshooting a range of problems which could include or be related to:

- equipment faults
- electrical faults
- interpreting information from process control system
- equipment failure
- cell instability
- feeder problems
- anode effect poles
- metal tapping
- bath tapping
- beam height
- anodes
- materials handling systems
- loading anodes and anode effect.

Required knowledge

Competence includes a comprehensive understanding of the reduction line process and equipment principles and typical problems to a level needed to support the operation of the reduction cells. Additionally an operational knowledge of the cell tending equipment will be required. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements

and knowledge of:

- all items on a schematic of the reduction cell process and the function of each
- basic principles of operation of reduction cell equipment items, including cathode bed, anodes and adjusters, feeders, bath conditions, current distribution
- basic understanding of the product specifications, including depth of cover and uniformity of aluminium layer
- basic principles of operation of the cell tending equipment, including the crane and all

REQUIRED SKILLS AND KNOWLEDGE

- attachments
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for timely assessment of parts of this competency unit (eg Elements 2, 5). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- emergency responses are known.
- hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- early warning signs of equipment needing attention or with potential problems are recognised, that is, alarms, indicators or unusual noises or performance in equipment.

EVIDENCE GUIDE	
	These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units. This competency may be assessed in conjunction with: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>MSAPMSUP205A Transfer loads.</i> Other units which are relevant to the job.
Guidance information for assessment	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
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 italicized 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 if the

RANGE STATEMENT	
candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Cell maintenance	Reduction cell maintenance activities includes: • adjusting bath cover • housekeeping • ensuring covers, safety equipment and guards are in place
Emergency responses	Emergency responses include those related to: • leak/loss of containment • evacuation due to fire or open circuit cell • loss of power • excessive emissions of fumes or particulate • major oil spill • equipment failure.
Equipment and tools	Equipment and tools may include: • cell tending equipment • hand tools • harnesses and slings • materials handling equipment.
Hazards	Hazards may include: • heat (burns, dehydration and heat stress) • energy sources, eg hydraulic, pneumatic and electric • electro magnetic effects • high pressure piping and valves • pinch and crush points • moisture • banned items • mobile equipment and pedestrian interaction

RANGE STATEMENT	
	• suspended loads and roller conveyors • hazardous materials, eg reactive alumina, kaowool, tar and pitch • molten materials.
Hazard control methods	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Shutdown procedures	Shut down procedure must follow equipment and site authorised checklist and may include: • communication to supply and delivery areas • communication to impacting areas • obtaining appropriate authorisations • rescheduling operations • liaison with maintenance teams.

RANGE STATEMENT	
Reports and records	Reports and records may include: • computer readouts locally or in the control room • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality inspection reports of the product.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures, eg spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASMELT270A Supply product from reduction cells

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency applies to plant technicians who tap molten aluminium and bath material from reduction cells for the aluminium smelting process.

Application of the Unit

Application of the unit	Typically the plant technician would operate tapping or siphoning equipment to draw molten metal or bath from reduction cells. This competency unit typically covers items of equipment such as: • reduction cell (pot) • carbon anodes and beams • tapping siphons • metal crucibles The plant technician would: • conduct metal tapping • conduct bath tapping • recognise and respond to 'out-of-parameter' issues • respond to emergency situations • identify and control hazards in the workplace. Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for operations.	1.1. Interpret and confirm work requirements before proceeding 1.2. Identify and control hazards 1.3. Ensure appropriate authorisations have been obtained/issued 1.4. Identify work flow path (interruptions or bottlenecks) blockage.
2. Operate tapping equipment to procedures.	2.1. Monitor equipment operation and check operational variables are within parameters. 2.2. Respond to cell alarms and take appropriate action. 2.3. Verify equipment performance throughout the process 2.4. Apply operating principles to identify problems and take appropriate action 2.5. Siphon molten metal into crucible as required 2.6. Conduct routine housekeeping activities 2.7. Complete records as required for equipment operation and performance.

ELEMENT	PERFORMANCE CRITERIA
3. Stop metal tapping	3.1. Stop metal tapping and make area safe as required 3.2. Replace covers and other safety equipment as required 3.3. Communicate with technician operating cell tending equipment 3.4. Ensure others in the area are kept informed of operations

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes being able to demonstrate the following:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving.

Competence also includes responding to emergency situations such as:

- tap outs
- evacuation due to fire
- loss of power
- excessive emissions of fumes or particulate
- equipment failure
- recognising hazards associated with electromagnetic effects, moisture, wet bath and wet soda ash.

Troubleshooting a range of problems which could include or be related to:

- electrical faults
- interpreting information from process control system
- equipment failure
- cell instability
- feeder problems
- anode effect poles
- metal tapping
- bath tapping

REQUIRED SKILLS AND KNOWLEDGE

- beam height
- anodes
- current draw
- materials handling systems
- bake process
- loading anodes and anode effect.

Required knowledge

Competence includes a comprehensive understanding of the reduction line process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements (eg CTPV)

and knowledge of:

- all items on a schematic of the reduction cell process and the function of each
- basic principles of operation of main equipment items, including cathode bed, anodes and adjusters, bath conditions, crucibles and tapping equipment
- basic understanding of the product specifications, including depth of cover and uniformity of aluminium layer, and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for timely assessment of parts of this competency unit (eg Elements 2, 5). Simulation should be based on the

EVIDENCE GUIDE	
	actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • emergency responses are known. • hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job. • early warning signs of equipment/processes needing attention or with potential problems are recognised, ie monitoring systems in the reduction cell process, including equipment, material handling systems and mobile equipment. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.

EVIDENCE GUIDE	
	This competency may be assessed in conjunction with: • <i>MSAPMOHS200A Work safely</i> • <i>MSAPMOHS110A Follow emergency response procedures</i> • <i>MSAPMSUP205A Transfer loads.</i> Other units which are relevant to the job.
Guidance information for assessment	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	
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 italicized 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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Emergency responses	Emergency responses include those related to: • leak/loss of containment • evacuation due to fire or open circuit cell • loss of power • excessive emissions of fumes or particulate • major oil spill

RANGE STATEMENT	
	• equipment failure
Equipment and tools	Equipment and tools may include: • crucibles • tapping equipment • hand tools • harnesses and slings • materials handling equipment.
Hazards	Hazards may include: • heat (burns, dehydration and heat stress) • energy sources, eg hydraulic, pneumatic and electric • electro magnetic effects • high pressure piping and valves • pinch and crush points • moisture • banned items • mobile equipment and pedestrian interaction • suspended loads and roller conveyors • hazardous materials, eg reactive alumina, kaowool, tar and pitch • molten materials.
Hazard control methods	Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment
Housekeeping	Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.
Instrument/electrical systems	Instrument/electrical systems may include: • emergency shutdown systems • fire systems • pressure and temperature control systems • communications systems • utility systems.
Isolation	Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.
Monitoring systems	Monitoring systems may include:

RANGE STATEMENT	
	• monitoring the operation of reduction cell • monitoring the effectiveness of the process • condition of the bath. • monitoring abnormal trends in the operation of equipment or product specification.
Out-of-parameter issues	Out-of-parameter issues, faults and problems may include: • tap out • out-of-parameter operation or product • fluctuation in temperature, power consumption or product movement. • instruments and equipment requiring cleaning • equipment mechanical and electrical problems • flow path blockages • out-of-parameter emissions • unavailability of equipment, personnel or material.
Personal protective equipment	Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.
Pre-start checks	Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Shutdown procedures	Shut down procedure must follow equipment and site authorised checklist and may include

RANGE STATEMENT	
	• communication to supply and delivery areas • communication to impacting areas • obtaining appropriate authorisations • rescheduling operations • liaison with maintenance teams.
Reports and records	Reports and records may include: • computer readouts locally or in the control room • routine inspections (daily readings, monthly checks) • scheduled maintenance activities • shift log sheet • mandatory or statutory inspections • hazard, accident and incident reports • quality inspection reports of the product.
Work requirements	Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures eg. spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP236B Operate vehicles in the field

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario an operations technician patrols areas of pipeline or follows pipelines across a variety of terrains looking for problems which require maintenance or reporting. During the course of their work they must check the vehicle for mechanical soundness before leaving base, ensure it is securely and adequately packed, make certain their communications equipment and contact schedule are in order and generally be prepared for long periods off-road.

Application of the Unit

Application of the unit	Generally the operations technician would be part of a team during field trips, though he/she may be required to undertake limited trips during which they would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with their base station. The operations technician will: • check their vehicle daily for damage • ensure fuels and lubricant levels are maintained • effect minor repairs • communicate with their base station This unit has no prerequisites. However operators will have the appropriate class of driver's licence before taking charge of the vehicle.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare vehicle and secure load.	1.1. Conduct vehicle familiarisation checks before starting journey 1.2. Note and rectify any defects where possible or report vehicle for further attention/repair 1.3. Ascertain that all required fuel, water and other supplies required for the journey are available and in useable order 1.4. Inspect all ancillary equipment and operational accessories to ensure they have been attached or secured in a safe and agreed manner 1.5. Secure load including external loads, rear tray, roof racks, and any loads within the vehicle, using appropriate securing equipment.
2. Undertake journey	2.1. Familiarise oneself with the route to ensure that an appropriate route has been determined 2.2. Interpret access manuals and topographical maps in order to obtain required information for journey 2.3. Obtain relevant authorisations/notifications and accesses before starting the journey 2.4. Confirm and/or clarify or communicate journey details with relevant company personnel 2.5. Monitor driving conditions and requirements constantly, to meet any changes in terrain, weather conditions and road conditions and requirements

ELEMENT	PERFORMANCE CRITERIA
	2.6. Monitor and maintain fluid levels and air pressures to ensure safe and efficient vehicle operations 2.7. Monitor vehicle constantly for any malfunctions or factors that may affect vehicle performance 2.8. Maintain vehicle speeds within all stated limits and road condition limitations to minimise the risk of personal injury, environmental damage and load damage 2.9. Maintain communication as required with the relevant company personnel to advise of progress and journey status. 2.10. Ensure seatbelts are worn by all personnel while the vehicle is in motion.
3. Operate vehicle	3.1. Apply knowledge of vehicle differences to the driving requirements of four wheel drive and conventional vehicles 3.2. Adhere to general principles of four wheel driving in negotiating a variety of terrains and driving conditions 3.3. Use defensive driving techniques 3.4. Observe additional precautions for night driving 3.5. Drive to suit road conditions 3.6. Observe rules prohibiting driving under the influence of alcohol and other performance inhibiting substances.
4. Finalise journey	4.1. Communicate and confirm termination of journey with the relevant company personnel 4.2. Visually inspect the vehicle to ensure that vehicle is in good repair and order 4.3. Unsecure trailer loads and prepare for unloading utilising the agreed uncoupling process 4.4. Report faults or damage to vehicle to appropriate personnel.
5. Recover vehicle	5.1. Identify and assess options for recovery of an immobilised vehicle 5.2. Operate recovery equipment safely 5.3. Perform a battery 'jump start' safely 5.4. Observe safety precautions when rigging cables and chains 5.5. Demonstrate various methods of vehicle recovery 5.6. Change a wheel on a properly jacked vehicle.
6. Maintain vehicle safety	6.1. Observe appropriate speeds for the road conditions 6.2. Ensure all personnel use a seat belt 6.3. Observe site specific vehicle entry restrictions 6.4. Follow appropriate search and rescue notification procedures 6.5. Follow appropriate procedures for passing large or heavy

ELEMENT	PERFORMANCE CRITERIA
	vehicles.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
Competence includes the ability to distinguish between causes of vehicle problems/alarms/fault indications such as: - instrument failure/malfunction - electrical failure/malfunction - mechanical failure/malfunction.
Required knowledge
The knowledge referred to in the Evidence Guide for this unit includes: - local/company vehicle rules and regulations - hazards and risks of off-road travel - requirements for reporting and recording vehicle movements - communications arrangements (backup methods need to be considered) - site or area response plan to detail - procedures to be followed when an incident is reported - actions to be followed when a traveller is recorded as overdue - responsibilities for monitoring vehicle journeys and determining immediate and follow-up actions under the system.

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment for this unit of competency will be on an off-road vehicle. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other

EVIDENCE GUIDE	
	relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency (eg Elements 1, 3 and 4). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in off-road vehicle operation and the equipment integral to its use, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the vehicle, incidents on similar vehicles around the world, hazard analysis activities and similar sources.
Context of and specific	Assessment will require access to an operating well over an

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resources for assessment	extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all organisations it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: • <i>PMASUP241B Maintain pipeline easements</i> • <i>PMASUP242B Monitor pipeline civil works</i> • <i>PMASUP343B Monitor and maintain pipeline cathodic protection systems</i> • <i>PMASUP344B Monitor and control repairs and modifications on operational pipe</i> • <i>PMAOPS230B Monitor, operate and maintain pipeline stations and equipment.</i>
Guidance information for assessment	Assessment process 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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such vehicles and equipment which form part of the field operator's kit. For your organisation this may include (select relevant items): • 4wd vehicles, eg utility, troop carrier or station wagon • trucks • communications equipment, ie 2 way radio, mobile or satellite phone,

RANGE STATEMENT

	GPS • recovery equipment, ie snatch straps, slings, chains and shackles • trailers. Typical problems for your operations may include: • overheating (coolant, exhaust, driveline) • low oil pressure • electrical discharge/overcharge • tyre punctures • load shifts.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP237B Undertake crane, dogging and load transfer operations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency applies to an operator who has a qualification as a crane operator or licensed dogger, or who is licensed to operate heavy machinery, moves materials and portable plant around a site. It covers the safe movement of equipment and supplies, correct stacking, loading and unloading of supplies and equipment and initiating routine and emergency maintenance on equipment.

Application of the Unit

Application of the unit	Generally the operations technician would be part of a team and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not include forklift operation. For forklift operation see <i>TDTD1097 Operate a forklift</i>. There may be licensing requirements for this unit. Check local regulations.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare work.	1.1. Carry out a job hazard analysis/job safety analysis for job 1.2. Adhere to site requirements 1.3. Secure a permit to work as required 1.4. Determine coordination requirements with other site personnel 1.5. Determine job method to include hazard prevention and controls, Australian standards for safety procedures, codes of practice and manufacturer specifications 1.6. Erect barricades, warning signs, overhead protection to requirements 1.7. Calculate mass and dimensions of load 1.8. Calculate safe working load 1.9. Determine positioning of load.
2. Select equipment.	2.1. Select lifting/moving equipment and accessories consistent with requirements and within safe working capacity of equipment 2.2. Inspect gear and label and reject damaged/worn items 2.3. Select, use and correctly fit personal protective equipment.
3. Secure load.	3.1. Secure load and protect to prevent damage 3.2. Secure moving/loose parts of load and lash to prevent movement 3.3. Attach, position, adjust and secure equipment correctly, to meet requirements for movement of load.
4. Move load.	4.1. Prepare load destination to accept load 4.2. Move load safely to required destination in accordance with planned

ELEMENT	PERFORMANCE CRITERIA
	procedure 4.3. Use standard communication signals to co-ordinate safe movement of the load.
5. Remove gear.	5.1. Remove equipment/gear/accessories safely from load 5.2. Inspect equipment/gear/accessories for wear and damage, clean, maintain and store, and record usage and condition 5.3. Complete site/job records.
6. Control hazards.	6.1. Identify hazards in site work area 6.2. Assess the risks arising from those hazards 6.3. Implement measures to control those risks in line with procedures and duty of care.
7. Respond to problems.	7.1. Monitor transfer frequently and critically throughout load shifting using measured/indicated data and senses (sight, hearing, etc) as appropriate. 7.2. Recognise transfer problems 7.3. Analyse cause of transfer problems within scope of skill level 7.4. Take timely and appropriate action to solve transfer problems.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Ability to isolate the causes of problems to an item of equipment within the load shifting system and to distinguish between causes of problems/alarms/fault indications such as:

- equipment failures
- load spills or damage
- electrical failure
- mechanical failure
- operational problems.

Required knowledge

- safe working capacity and limits of the equipment
- company specific work organisations and workflow
- all items on a schematic of the equipment and the function of each
- nature/condition of materials being shifted and the particular hazards of each.

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of the load shifting equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk- throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to apply pre-requisite skills within the context of an operating plant, recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that:

EVIDENCE GUIDE	
	• early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes of problems can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a safe lifting operation is performed • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	As a general rule assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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
The Range Statement relates to the unit of competency as a whole. It allows for different work

RANGE STATEMENT	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the site load-shifting system. For your plant this may include (select relevant items): • crane • front end loader • dogging and rigging equipment • load-shifting equipment, eg slings, ropes, shackles, eye bolts, spreader beams, equalising gear, clamps, pulley systems, winches, packs, rigging screws. Typical of the plant and equipment moved are: • packaged compressor units • large pumps and valves • pipe.
Site information	Site information may include: • plans • drawings • specifications.
Requirements	Requirements may be set by: • State regulatory bodies • road traffic authorities • local government • enterprise/company.
Typical Problems	Typical problems for your plant may include: • unstable loads or load swinging • faulty or damaged lifting gear • obstructions on site • unsafe lifting practices.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of

RANGE STATEMENT	
	responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP241B Maintain pipeline easements

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, operators are required to conduct ground and/or aerial patrols to monitor and determine easement condition so as to maintain and ensure pipeline integrity. This includes continuous liaison and contact with a range of stakeholders, including landowners and contractors associated with pipeline systems and relevant company personnel.

Application of the Unit

Application of the unit	Generally operators would be part of a team and would be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team. The operator would: • monitor and report on signage, gate or other difficulties • identify and advise the organisation of any pipeline operational problems • facilitate access to pipelines in consultation with appropriate stakeholders within the context of relevant regulations • facilitate provision of resources to deal with pipeline incidents. This unit does not include the monitoring of civil works - see <i>PMASUP242B Monitor pipeline civil works</i>.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare maintenance activity	1.1. Interpret topographical and geographical maps to determine the selection of access to pipeline route 1.2. Select and operate equipment appropriate to the maintenance task in accordance with procedures 1.3. Inspect and assess easement to determine the required maintenance activities 1.4. Interpret assessment results and take appropriate actions.
2. Maintain pipeline easement and surrounding environment.	2.1. Maintain easement in accordance with legislative requirements and enterprise requirements 2.2. Isolate and secure any required work areas as required by procedures 2.3. Monitor and log the condition of signage/gates and easement ancillary equipment 2.4. Take appropriate action.
3. Maintain liaison with stakeholders.	3.1. Maintain continuous liaison and contact with pipeline system stakeholders 3.2. Advise stakeholders of intended activities in accordance with procedures 3.3. Conduct meetings with stakeholders to discuss notified issues as required

ELEMENT	PERFORMANCE CRITERIA
	3.4. Record meeting outcomes in accordance with legislative and enterprise requirements 3.5. Take appropriate action.
4. Control hazards.	4.1. Identify hazards in pipeline work area 4.2. Assess the risks arising from those hazards 4.3. Implement measures to control those risks in line with procedures and duty of care.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Competence includes the ability to isolate the causes of problems to the pipeline and to distinguish between causes of problems/alarms/fault indications such as:
- various disturbances on or in the easement
- visual evidence of a pipeline rupture
- erosion and subsidence.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- appropriate local knowledge
- specific environmental procedures and requirements
- legal obligations and standing of both parties as it relates to access rights
- knowledge of the pipeline system and access routes
- appropriate and safe vegetation control techniques
- erosion control techniques
- company and legislative environmental policies, practices and procedures
- pipeline signage and application requirements.

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in

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conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual pipeline and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the pipeline and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of pipeline easements needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is planned and implemented to rectify identified problems

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	effective communication and interpersonal skills are used in relation to third party liaison activities.
Context of and specific resources for assessment	These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of pipelines, incidents on similar pipelines around the world, hazard analysis activities and similar sources.
Method of assessment	Assessment will require access to pipeline easements and pipeline maintenance work sites over an extended period of time or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions. It may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: <i>PMASUP242B Monitor pipeline civil works</i>
Guidance information for assessment	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	
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.	
Codes of practice/	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

RANGE STATEMENT	
standards	
Context	This unit of competency includes all such items of equipment and unit operations which are utilised in the maintenance of pipeline easements. For your enterprise this may include: • light aircraft (pilot provided) • off road vehicles • gas leakage detectors • vegetation control documentation • workplace mapping, eg pipeline alignment drawings, topographical maps, geographical maps • pipeline access route manuals • MSDS information • operating procedures.
Typical problems	Typical problems for your enterprise may include: • isolation and risk of exposure • gas or fluid leaks • accidental or geophysical rupturing of pipelines.
Easement	An easement is an area or strip through which a pipeline, or similar infrastructure runs. It may be owned by the operating company or a third party (or government, NGO or similar). The pipeline may be above or below the easement.
Stakeholders	Stakeholders may include: • landowners • contractors • company personnel • regulators and other officials.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures

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	• formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP242B Monitor pipeline civil works

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, operators are required to plan and monitor civil works and maintenance activities being carried out on pipeline easements and associated facilities by external contractors.

Application of the Unit

Application of the unit	Generally the operator would be part of a team, though on occasions would be required to work individually and in isolation and would be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team. The operator would: • identify and report on the nature of civil works to be undertaken in relation to pipeline easements • establish the suitability of the equipment and machinery to be used in the work • ensure the site is accessible to equipment and authorised personnel • work with third parties and contractors.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	Identify work requirements Identify and control hazards Coordinate with appropriate personnel
2. Interpret civil drawings and data	2.1.Determine required civil works through the interpretation of reports and investigations 2.2.Access and interpret pipeline alignment drawings to determine area of excavation/civil activity 2.3.Liaise with appropriate authorities, third parties and/or company personnel.
3. Inspect machinery	3.1.Inspect equipment required to undertake civil works to ensure that it conforms to requirements 3.2.Determine most appropriate method of deploying equipment to site 3.3.Monitor equipment deployment to site and take appropriate action.
4. Prepare easement/site for civil activities	4.1.Inspect site for the civil works prior to any work commencing 4.2.Ensure site is prepared 4.3.Apply knowledge of pipeline crossing design prior to excavation/ activity commencing 4.4.Issue permits for work to be carried out if appropriate.
5. Monitor easement/site	5.1.Monitor civil works and take appropriate action

ELEMENT	PERFORMANCE CRITERIA
for civil activities	5.2.Restore the work affected area on completion of civil works 5.3.Close issued permit

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems in pipeline easements and to distinguish between causes of problems/alarm/fault indications such as:

- inappropriate work practices
- visual evidence of a pipeline rupture
- erosion and subsidence
- equipment breakdowns
- smell or sound of escaping pipeline contents.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- pipe locating equipment
- the operation of gas detection equipment
- use of safety signage/barricades and materials
- the use of pipeline alignment drawings
- relevant State and Federal legislation
- legal obligations and standing of parties as it relates to access rights where civil works are conducted on easements that require access to private property
- company procedures and company work instructions
- environmental management programs.

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and

EVIDENCE GUIDE

Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the pipeline and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- company policies and procedures for pipeline maintenance work are understood and followed
- early warning signs of equipment needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is planned and implemented to rectify identified problems.

These aspects may be best assessed using a range of

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	scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of pipeline maintenance work, incidents on similar pipeline systems around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to pipeline easements and pipeline maintenance work sites over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: • <i>PMASUP241B Maintain pipeline easements</i> • <i>PMASUP236B Operate vehicles in the field.</i> • <i>MSAPMPER300B Issue work permits</i>
Guidance information for assessment	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	
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 italicized 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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

RANGE STATEMENT	
Context	This unit of competency includes all such items of equipment and unit operations which form part of the monitoring system. For your enterprise this may include: • pipe locating equipment • gas detection equipment • transport and excavation equipment • hand tools • safety signage/barricades and materials.
Site preparation	Site preparation includes: • site preparation in accordance with outcomes of inspection • conduct hazard analysis complete, adequate and thorough • site layout is appropriate • lay down areas appropriate • site access is suitable
Monitoring of civil works	Monitoring of civil works to include: • ensuring pipeline integrity • adherence to permit to work and procedure requirements • adherence to required health, safety, environmental and legislative requirements for site/works.
Typical problems	Typical problems might include: • isolation and risk of exposure • gas or fluid leaks • accidental or geophysical rupturing of pipelines.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions

RANGE STATEMENT

	any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP243B Monitor and maintain pipeline coatings

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, the operator will be carrying out inspection and testing activities on coated pipelines both in the plant and in the field to procedures and to the parameters established through the principle reference standard AS 2885 Part 3. They will also be involved in maintaining the pipeline coating which may have sustained damage for a variety of reasons. Activities will include assessing, through a range of testing and inspection techniques, the integrity of a pipeline's protective coating, and identifying areas requiring repair. Pipelines typically will require preparation to enable the work to be carried out, followed by inspection and testing activities to procedures to ensure the adequacy of the repair work.

Application of the Unit

Application of the unit	Generally the operator would work on an individual basis and would be expected to be capable of performing all parts of this unit. They would be part of a team during pipeline startup and shutdown procedures. At all times they would be liaising and cooperating with other members of the team. The operator would: • identify and rectify operational problems • maintain a suitable database of information • utilise the information to develop appropriate intervention strategies

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
2. Prepare pipelines for inspection/testing	2.1. Plan and prepare for inspection of pipeline coating to procedures 2.2. Identify pipeline location to determine workplace hazards 2.3. Consult appropriate personnel to ensure the work is coordinated effectively with others involved on the work site 2.4. Obtain tools and equipment needed to carry out the work to procedures and check for correct operation and safety.
3. Inspect and test pipeline coatings	3.1. Visually inspect pipeline coatings to determine condition and location of irregularities 3.2. Test pipeline as required to ensure system conforms to required operating parameters

ELEMENT	PERFORMANCE CRITERIA
	3.3. Take appropriate action 3.4. Report and record information related to status and any irregularity/deviations to procedures.
4. Prepare pipeline surface and repair coating	4.1. Isolate work area to enable repair to proceed to procedures 4.2. Prepare the pipeline surface to receive the coating repair material using appropriate methods 4.3. Recoat the pipeline to procedures and test the repair area.
5. Notify completion of work.	5.1. Ensure worksite is clean and waste material is disposed of correctly to procedures and legislative requirements 5.2. Inform the control centre of the outcome of repairs and any abnormal situations 5.3. Return pipeline system to normal service to procedures if safe to do so 5.4. Notify work completion, incidents and irregularities to procedures.
6. Compile and analyse reports	6.1. Collect and compile repair and operational data into accepted reporting format 6.2. Take appropriate action 6.3. Ensure reports provide an accurate and ongoing record of deviations in the performance of the pipeline system 6.4. Utilise information or reports for short and long term control planning.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to equipment within the pipeline system and to distinguish between causes of problems/alarm/fault indications such as:

- variations in coating thickness
- instrument failure/wrong reading
- CP system characteristics

REQUIRED SKILLS AND KNOWLEDGE

- incorrect interpretation of MSDS information
- operational problems.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- all items on a schematic of the pipeline system and the function of each
- surface coating materials, their composition and application
- routine and non-routine repair techniques
- causes and remedies of common problems such as those selected in the range of variables
- various coating inspection and test requirements.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the pipeline and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can

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	be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant and field areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	As a general rule assessment will require access to an operating pipeline system over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for	Assessment processes and techniques must be

EVIDENCE GUIDE	
assessment	culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the inspection and testing system. For your plant this may include: • low voltage and high voltage holiday detectors • coating materials • coating thickness gauges and meters • densitometers • condensators • coating defect assessment survey equipment, eg DCVG method equipment, Pearson technique method equipment.
Typical problems	Typical problems for your situation may include: • coating failure • temperature, pressure and flow variations • damage from geophysical or other circumstances • communication failures.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred

RANGE STATEMENT	
	reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: - all work instructions - standard operating procedures - formulas/recipes - batch sheets - temporary instructions - any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector	Support/generic

Competency field

Competency Field	

Co-requisite units

Co-requisite units		

PMASUP244A Prepare and isolate plant

Modification History

New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to isolate and prepare plant for subsequent work, typically maintenance of some sort. It also includes preparing the plant for return to service.

Application of the Unit

This unit applies to a person who has the responsibility for isolating and preparing plant. This is probably part of their work role, although it could be a full time secondment for a major shutdown. The type of people to whom this unit may apply include (but are not limited to):

- operators, and maintainers
- maintenance personnel.

While this unit is written to apply to an individual they will usually undertake it in liaison with relevant experts and stakeholders.

This unit applies:

- after the isolation and preparation plan has been authorised
- before the work commences.

This unit has a strong relationship with the relevant 'permit' units (e.g. MSAPMPER200B Work in accordance with an issued permit and MSAPMPER300C Issue work permits) and decommissioning/recommissioning units (e.g. PMASUP440B Commission/recommission plant and PMASUP441C Decommission plant). Where relevant, these units should also be accessed.

This unit requires a detailed knowledge of the plant to be prepared and isolated, such as might be obtained from the relevant technical units covering this plant. Hands-on operating competency, however, is not necessarily required.

This unit does not include the planning for the isolation and preparation of plant - see PMASUP444A Plan plant preparation and isolation.

This unit has been written with the preparation and isolation of hazardous plant, such as a major hazard facility in mind. However, it should also be applicable to the preparation and isolation of lower hazard plants and mobile plant with appropriate contextualisation.

Much of this unit is iterative and the text below should not be taken as specifying necessary sequence.

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	Perform the isolations	1.1	Communicate with panel operator and other stakeholders
		1.2	Execute authorised isolation plan
		1.3	Remove materials and energy, as required
		1.4	Control any releases to the environment in accordance with plant procedures
		1.5	Prove the effectiveness of the isolation
		1.6	Decontaminate plant and equipment, as required
		1.7	Recognise and take appropriate action on any inconsistencies
		1.8	Test for residual hazards
		1.9	Complete required paperwork
		1.10	Sign off isolations, as required

		1.11	Hand over to/from shift, as required
2	Prepare plant for the work	2.1	Execute authorised preparation plan
		2.2	Recognise and take appropriate action on any inconsistencies
		2.3	Confirm plant is ready for the work
		2.4	Hand over plant to the work party
		2.5	Monitor work and plant, as required
3	Prepare plant for return to service	3.1	Confirm work is complete and site/plant has been left in acceptable condition
		3.2	Accept handover from work party
		3.3	Obtain authority to deisolate
		3.4	Execute authorised deisolation plan
		3.5	Sign off the deisolation, as required
		3.6	Reverse purge as required by plan for return to service
		3.7	Execute authorised plan for return to service
		3.8	Test as required
		3.9	Advise plant is ready for service
		3.10	Complete required paperwork

Required Skills and Knowledge

Required skills include:

Ability to:

- read and interpret technical documentation and drawings/graphics
- interpret material safety data sheets (MSDS)
- interpret test results (e.g. for atmosphere/gas testing and leak testing)

Required knowledge includes:

Knowledge of:

- work control system for site and organisation
- existence of regulations and other external controls relevant to the proposed work
- isolation philosophy of organisation
- isolation and preparation plan for work
- plant energy sources and their methods of being de-energised and isolated
- hierarchy of isolations
- methods of proving isolations
- methods and equipment used for purging and ventilation
- physical properties of process materials (e.g. density and viscosity)
- hazardous properties of relevant materials (e.g. process, purging and ventilation materials)
- decontamination methods and requirements for various materials and situations
- as low as reasonably practicable (ALARP) concept
- importance of appropriate rates of change for pressure and temperature for vessels and other plant
- significance of time allowed for draining, purging, ventilation
- fluid dynamics relating specifically to draining piping systems:
 - the ability of a liquid to ‘hang-up’ in pipework, the importance of identifying high point vents to release gas/vapours and low point drains to release liquids
 - determining the amount of liquid drained from a piping section to ascertain that draining has been effective/prove drainage
- the potential effects (e.g. damage to tanks or vessels) of vacuum by not draining correctly (e.g. by pulling a vacuum behind a slug of liquid)
-

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria required skills and knowledge range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	This unit should be assessed as holistically as is practical and will generally be assessed using a workplace project as a significant assessment activity.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • perform isolations to plan for a significant item of equipment or plant area • prepare plant for the work to plan • prepare plant for return to service to plan.
Context of and specific resources	Assessment of performance must be undertaken in a

for assessment	workplace. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned work • documentation relating to the plant, process and materials • the isolation and preparation plan • any other materials which would normally be available in the workplace while conducting this activity.
Guidance information for assessment	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

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.

Isolation	Isolation is a process for ensuring no energy or material can enter the isolated area
Plant energy sources	Plant energy sources may include, but are not limited to: • electricity (mains, solar and by generator) • chemicals and fuels • heat and steam • pneumatic pressure (compressed air, and other fluids under pressure, such as water or hydraulic oil) • energy storing devices, such as batteries, springs, flywheels, accumulators and capacitors • gravity (and its ability to cause items to fall) • radiation

Control releases	Controlling releases to the environment may include, but is not limited to: • preventing any release • containing any release • recovery and reuse or disposal of any release
Preparation	Preparation is a process for ensuring that plant and equipment is in a safe and appropriate condition for the required work. Preparation may include, but is not limited to: • draining • purging • inerting • ventilating • controlling atmosphere (e.g. to ensure it is breathable, and is not within the flammable range) • adjusting temperature to make a workable environment • adjusting pressure (usually to atmospheric) • ensuring adequate access and egress
Isolation plan	Execution of the isolation plan may include, but is not limited to: • confirming availability of plant, equipment and/or systems • verifying plant, equipment and/or systems • verifying isolation location • securing and identifying isolation points • labelling isolation points • doing the isolations • managing the isolations • managing lock out/tag out to procedure • cross checking isolations • undertaking self-isolation, where appropriate
Remove materials and energy	Removing materials and energy may include, but is not limited to: • draining, purging and venting of process materials • mitigation of stored energy • appropriately catching and disposing of any removed materials
Effectiveness of isolation	Proving the effectiveness of the isolation may include, but will not be limited to:

	• checking that any leaks are acceptable • proving depressuring • proving purging • checking bleed from double block and bleed, where appropriate • proving the atmosphere is as required • using gas detectors/meters • proving the isolation is effective • surveillance of isolations
Required paperwork	Required paperwork may include, but is not limited to: • isolation register • lock out/tag out register • required reports • required permits/work packs • filing of documentation Paperwork will conform to the site requirements and document control systems Paperwork may be: • paper, electronic or other approved form
Test as required	Testing of plant as required as part of preparation for return to service may include, but is not limited to: • pressure and leak testing • atmosphere/gas testing • testing the restoration of utilities and services

Unit Sector(s)

Support

Custom Content Section

Not applicable.

PMASUP305A Operate offshore cranes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competence applies to a person who is required to operate a crane on an offshore facility and captures the competency needed to do that.

Application of the Unit

Application of the unit	Generally the crane operator would liaise and cooperate with other members of the facility onboard team and would also respond to information from crew on a support vessel. Actions may include transfer of equipment to and from the support vessel; transfer of personnel between the facility and another vessel using appropriate approved equipment; and safe management of loads during diving operations. The individual would: • follow occupational health and safety workplace procedures • ensure that lifts are conducted within operational/environmental limits • verify the integrity of the crane prior to use • check communications • verify that cargo meets company lifting standards • establish lifting/discharge sequence • conduct the lift safely. A license may be required, please check the appropriate regulations.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for lift	1.1. Determine job requirements including potential hazards 1.2. Identify and apply environmental requirements for the lift in accordance with company procedures and crane limitations 1.3. Check suitability of load to be lifted 1.4. Identify, obtain and inspect materials, equipment and resources to satisfy the job requirements 1.5. Follow safety and environmental requirements in accordance with site specific procedures 1.6. Discuss contingency plans with lifting team members, including supply vessel crew 1.7. Check work location for safe working area requirements
2. Conduct routine checks of the crane	2.1. Carry out routine pre-operational equipment checks in accordance with company procedures 2.2. Commence start up procedures and check crane controls for correct operation and ease of movement 2.3. Check communication systems are fully operational 2.4. Check emergency safety devices are fully operational
3. Communicate with work group	3.1. Communicate job sequencing schedule with team and/or crew members to ensure an appropriate level of coordination

ELEMENT	PERFORMANCE CRITERIA
	3.2. Advise team members of changes to lifting schedule as required 3.3. Identify and use communication methods in accordance with company procedures
4. Operate crane offshore	4.1. Determine the load destination and check integrity of the landing area 4.2. Conduct a trial lift 4.3. Lift, move and place load safely to required destination 4.4. Respond to changes to lifting schedule when warranted 4.5. Use appropriate communication methods to coordinate safe movement of the load
5. Shutdown crane and review operations	5.1. Clear work area and dispose of or deal with materials in accordance with procedures and job specification 5.2. Shutdown crane in accordance with company procedures 5.3. Apply work completion procedures and notify relevant personnel that work is finished 5.4. Review operations, report and record learnings and significant findings

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence may include the ability to:

- use radio equipment to send and receive information
- manoeuvre and position load shifting equipment
- conduct operator maintenance according to procedures
- maintain crane logs
- conduct visual checks of crane operating systems and cables
- identify faults, defects or abnormalities and correctly report and record these
- recognise abnormal lifting circumstances and safely abort the lift.

Required knowledge

The knowledge referred to in the evidence guide for this unit includes:

REQUIRED SKILLS AND KNOWLEDGE

company procedures

- relevant statutory requirements and codes of practice
- equipment operation, limitation and procedures
- crane safety systems
- safe operating principles
- safe working loads
- the impact of weather or climatic conditions on lifting practices
- cargo planning
- operator maintenance.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be by way of demonstration under workplace conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of operational circumstances.

Initial knowledge and skill may be assessed through appropriate simulations which must, as closely as possible, approximate actual workplace conditions and circumstances, and should be based on the actual facility. Assessments should include explanatory 'walk- throughs' of the relevant competency components.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what-if' scenarios both in the facility (during demonstration of normal operations and "walk-throughs" of abnormal operations) and off the site.

Critical aspects for assessment and evidence required to demonstrate

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring

EVIDENCE GUIDE	
competency in this unit	action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related operating areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the crane, incidents on similar cranes around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require: • access to a working offshore crane in an on-site environment over a range of situations • use of an accurately simulated environment where appropriate, to assess underpinning knowledge and skills A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all workplace environments it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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

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 italicized 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.

Codes of practice/ standards

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Types of legislation include:

- AS 2550.1 Safe use of Cranes
- Norsok Standard R-003 - Safe use of lifting equipment
- Offshore Petroleum Act 2006
- National Offshore Petroleum Safety Authority Safety Case Guidelines September 2004
- Petroleum (Submerged Lands) (Management of Safety on Offshore Facilities) Regulations 1996
- Statutory Rules 1996 No. 298 as amended

Other:

- OMHEC Training Standard (OHMEC TS 11 March 2003)
- http://www.mms.gov/regcompliance/PDFs/GL-I_2005.pdf
- <http://www.ogp.org.uk/pubs/376.pdf>
- EN12079
- IMO Circular 860
- DNV 2.7-1 & 2.7-2

Job requirements

Job requirements include:

- work instructions
- work plans
- equipment specifications
- company specific lifting standards and safe working procedures

Context

The facilities that may be utilised for assessment include but are not limited to FPSOs, MODUs, Fixed Platforms, Dive Support Vessels, and FSUs but does not include Derrick Barges

Types of cranes may include:

- Derrick
- Slewing Pedestal
- Bridge and Gantry

RANGE STATEMENT	
	• Knuckleboom • Mobile Slewing Crane
Types of environments	Types of environments may include: • day and night operations • facilities subject to helicopter operations • tropical and temperate climatic conditions • emergency lifts • multi-crane operations including intersecting radii • restricted radius • active hydrocarbon production • active drilling operations • exploration activities • diving support • blind lifts • personnel transfer • engineered lifts
Trial lift	Trial lifts may be conducted to ensure: • stability of load is not compromised • load is not near capacity of crane • load is not of unusual proportions
Health, Safety and Environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal Petroleum legislation and Navigation Act legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Regulatory bodies which may serve to affect this standard include: • National Offshore Petroleum Safety Authority (NOPSA) • Australian Maritime Safety Authority (AMSA) • State/Territory OSH Regulatory bodies, • Department of Transport and Regional Services (DOTARS)
Relationship to Major Hazard Facility Legislation	Organisations within the offshore petroleum industry may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)]. This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate

RANGE STATEMENT

	contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP311A Operate communications hub

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the using of a range of communication equipment and ensuring that required communications are completed. It includes the coordination and prioritisation of communications from/to diverse people in both normal and abnormal situations.

Application of the Unit

Application of the unit	In a typical scenario a control room operator/panel technician receives, relays and acts upon a range of communications as part of their role. This unit may also apply to personnel other than panel operators who perform a similar role. It includes: • process related communications • emergency communications • work related communications • personal communications • miscellaneous communications • communications under both normal and abnormal plant/ process/ weather conditions • communications under stress when multiple activities are occurring simultaneously.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use communication modes.	1.1. Turn equipment on/off as appropriate 1.2. Ensure equipment remains operational 1.3. Follow appropriate protocols for each communication mode being used 1.4. Select appropriate mode for use 1.5. Ensure communication used is safe for environment.
2. Deal with incoming communications.	2.1. Receive communication 2.2. Determine action required from communication 2.3. Prioritise communication in keeping with all current activities 2.4. Decide which communications to action, when and how 2.5. Maintain confidentiality as appropriate 2.6. Take action required by communication in the current circumstances 2.7. Ensure communication reaches its intended destination in an appropriate time frame.
3. Initiate communications.	3.1. Translate process issues into communications as required 3.2. Identify stakeholders for any required communication 3.3. Prioritise communications in keeping with all current

ELEMENT	PERFORMANCE CRITERIA
	activities 3.4. Select appropriate communication mode 3.5. Communicate as required within an appropriate timeframe.
4. Verify communication.	4.1. Identify communications which require follow through 4.2. Identify communications delayed due to other priorities 4.3. Check all required communications have been received 4.4. Check appropriate actions have been initiated 4.5. Identify cause of non-communication/inappropriate action and take required action

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

This competency includes the following skills:

- analysis
- decision making
- communication
- prioritisation.

Required knowledge

Competence in this unit includes the following knowledge:

- use of different communication modes
- relative advantage of different communication modes
- communication protocols for organisation in different modes
- privacy requirements
- methods of prioritising communications with other activities
- issues requiring communication, with whom and with what priority
- possible actions arising from types of situations and communications.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to specify the requirements and then select the best solution to meet the necessary and desirable requirements.

Context of and specific resources for assessment

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Method of assessment

In all plants it may be appropriate to assess this unit concurrently with other relevant units.

Guidance information for

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy,

EVIDENCE GUIDE	
assessment	language and literacy capacity of the assessee and the work being performed.

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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency covers all communication which might pass through/be initiated by the communications hub.
Communication modes	Communication modes includes: • radios • phones • email • computer messaging • PA • written • verbal
Ensuring operational	Ensuring equipment is operational includes: • charging batteries as required • replacing batteries as required • arranging for maintenance as required
Communication protocols	Communication protocols includes: • radio protocols • verbal protocols • email protocols • memo/reporting/writing protocols • phone protocols
Current activities	Current activities includes all process operations including start up and shut down or other abnormal situations where any individual

RANGE STATEMENT	
	communication may be vital to the operation or a mere distraction.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP341B Monitor and maintain instrument and control systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the skills needed to monitor and maintain instrument/electrical systems used for process measurement and control of a process.

Application of the Unit

Application of the unit	In a typical scenario, a process technician would be able to: • test, repair and recommission instrumentation and control systems used in the industry • monitor equipment operation • issue permits to allow work to be undertaken • verify equipment operation • calibrate instrumentation • prepare and analyse reports related to the equipment/systems. This competency covers any control system/instrumentation forming part of a control system, such as those for compressor systems, prime movers, valve systems and systems measuring/controlling flow, pressure or temperature. It also covers the use of relevant test equipment. Control systems can be pneumatic, electrical/electronic, electro-pneumatic, computer-based, etc. This competency includes responding to emergency situations, such as a leaks, fire or equipment failure. It also includes troubleshooting a range of problems which could include electrical faults, calibration errors or equipment failure. Persons performing this competency would also, as part of their job role, identify and control hazards in their work area and with equipment/systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	<i>MSAPMPER300C</i>	<i>Issue work permits</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Monitor equipment operation	1.1. Monitor equipment operation according to instrument/electrical equipment operating principles and parameters 1.2. Access and interpret relevant technical drawings and schematics to determine system faults 1.3. Issue permit to work to allow work to be undertaken 1.4. Verify equipment operation/performance through test procedures to ensure correct operation and to confirm identified problems from other sources 1.5. Correct operational variations through calibration and adjustment 1.6. Document operational variations.
2. Test/repair equipment	2.1. Verify equipment is operating correctly and document test results

ELEMENT	PERFORMANCE CRITERIA
	2.2. Apply appropriate troubleshooting techniques to determine the cause of operational faults 2.3. Rectify operational faults through the application of relevant maintenance procedures 2.4. Isolate, remove and dispose of faulty equipment, and install new equipment 2.5. Verify the performance of newly installed equipment to ensure it meets required operational parameters and conditions 2.6. Record all repairs/installations to provide historical records of the condition of system equipment.
3. Recommission systems and equipment	3.1. Recommission repaired/installed equipment to on line operation in the correct sequence at the required operational parameters 3.2. Monitor or activate systems to ensure they are operating both safely and effectively 3.3. Close out permit to work and restore site/system to normal operation.
4. Compile and analyse reports	4.1. Collect information concerning deviations/repairs equipment and put into accepted reporting format 4.2. Compile reports ensuring they provide an accurate and ongoing record of deviations in pipeline processes and a current record of pipeline and equipment trends 4.3. Utilise information or reports for short and long term deviation control planning.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

A person undertaking this unit of competency would also be expected to demonstrate the knowledge and ability to:

- test, repair, recommission and monitor the operational condition of instrument control systems utilised within the industry
- communicate and report the operational condition and history of instrument control systems to other team members and company personnel

REQUIRED SKILLS AND KNOWLEDGE

- coordinate own work and the work of others including on site contractors/operators.

It is essential that a person be able to apply the underlying skills and knowledge contained within this competency across a range of instrument and control systems.

Required knowledge

A demonstrated working knowledge and application of the company-specific work organisations and workflow.

Demonstrated knowledge and application of:

- process and plant schematic and instrumentation diagrams
- operations and functions of instrumentation and control devices
- control functions, control regimes, adjustments and tuning
- test and calibration methods
- test equipment typically used with control system repair/maintenance/calibration.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and

EVIDENCE GUIDE	
	walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. Also confirm that the person undertaking this competency has the ability to: • implement all OHS and environmental procedures relevant to this unit • apply the permit to work system within the context of this unit • interpret a range of process and control system drawings and schematics in order to undertake required or identified repairs/modifications to electrical systems. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range

EVIDENCE GUIDE	
	of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with relevant OPS units. In a major hazard facility, it may be appropriate to assess this unit concurrently with relevant OHS units.
Guidance information for assessment	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	
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.	
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	Control systems for one or more of the following may be included: - compressor systems and equipment (compressors, monitoring systems, power supply systems, pumps, pumping systems and equipment, pressure vessels/filtration equipment, coolers, scrubbers, expanders, anti surge systems, safety systems and compressor control systems) - prime movers which may include turbine engines, reciprocating engines, electric motors (fuel and carburettion systems, ignition systems, lubrication systems, induction and exhaust systems, governing systems, power supply systems, safety and shutdown systems) - flow systems (piping systems, metering equipment, flow control equipment, pressure and temperature transmitters and transducers,

RANGE STATEMENT	
	telemetry equipment, PLCs, flow computers, electro-pneumatic process control equipment and their associated on-line analytical instrumentation such as gas chromatographs, moisture analysers, gas sampling and gas analysis equipment, pig) valve systems (non-control valves, control and shut off valves, non-return or check valves and pressure relief valves, manual hand operated actuator, gas/hydraulic actuator and pneumatic valves).
Emergency responses	Emergency responses include: - leaks/loss of containment - fire - equipment failure - hazards and incidents. Relevant personnel may include: - supervisors - maintenance personnel - organisation employees - contractors - government bodies.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: - all work instructions - standard operating procedures - formulas/recipes - batch sheets - temporary instructions - any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Reports	Reports may include: - routine inspections (daily readings, monthly checks) - scheduled maintenance activities - mandatory or statutory inspections - hazard and incident reports - quality assurance system requirements/reports. - Instrument/electrical systems may include: - process analysing systems, eg gas analysis - emergency shutdown systems

RANGE STATEMENT	
	• fire systems • pressure and temperature control systems • metering systems, eg orifice, turbine, positive displacement • telemetry and SCADA systems • communications systems • solar systems • utility systems.
Types of faults	Types of faults may include: • material leaks • electrical problems • compressor or pump failure • out of current inspection status • gauge failure or hose rupture/leaks • instruments out of calibration • non-flow of material • instruments and equipment requiring cleaning.
Test equipment	Test equipment and tools may include: • dead weight tester • transmission unit • ice point tester • decade box • multimeter • RTD calibrator • chart recorders • data logging equipment • hand tools • valves, actuators and flanges. The use and operation of personal computers, other hardware mediums and associated software is required.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite Units		

PMASUP342B Monitor and maintain electrical systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the skills needed to monitor and maintain electrical systems and equipment on systems used to carry products. People performing this competency may be required to possess an electrical licence from a relevant electrical licensing authority, depending on local legislative requirements

Application of the Unit

Application of the unit	People performing this competency would typically be able to: • test, repair and recommission electrical systems and equipment used in the industry • monitor equipment operation • issue permits to allow work to be undertaken • verify equipment and system operation • prepare and analyse reports related to the equipment/systems. This competency covers a wide range of electrical equipment and systems such as voltage regulators, alternators, generators and motors, battery banks, air conditioning systems, lighting, emergency shutdown systems, low voltage power systems, solar power systems, fire systems, and control panels. This competency includes troubleshooting a range of problems which could include electrical faults, or equipment failure. Persons performing this competency would also, as part of their job role, identify and control hazards in their work area and with equipment/systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	<i>MSAPMPER300C</i>	<i>Issue work permits</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Monitor equipment operation	1.1. Monitor equipment operation according to electrical equipment operating principles and parameters 1.2. Access and interpret relevant technical drawings and schematics to determine system faults 1.3. Issue permit to work to allow work to be undertaken 1.4. Verify equipment operation/performance through test procedures to ensure correct operation and seek confirmation of identified problems from other sources 1.5. Correct operational variations through calibration and adjustment 1.6. Document operational variations.
2. Test/repair equipment	2.1. Verify equipment is operating correctly and document test results ensuring that statutory electrical testing requirements have been completed 2.2. Apply appropriate troubleshooting techniques to determine the cause of detected operational faults 2.3. Rectify operational faults through the application of relevant maintenance procedures

ELEMENT	PERFORMANCE CRITERIA
	2.4. Isolate, remove and dispose of faulty equipment, and install new equipment 2.5. Verify installed equipment to ensure it meets required operational parameters and conditions 2.6. Record all repairs/installations to provide historical records of the condition of system equipment.
3. Recommission systems and equipment	3.1. Recommission repaired/installed equipment to on line operation in the correct sequence at the required operational parameters 3.2. Monitor or activate systems to ensure they are operating both safely and effectively 3.3. Close out permit to work and restore site/system to normal operation.
4. Compile and analyse reports	4.1. Collect information concerning deviations/repaired equipment, and put into accepted reporting format 4.2. Compile reports ensuring they provide an accurate and ongoing record of deviations in pipeline processes and a current record of pipeline and equipment trends 4.3. Utilise information or reports for short and long term planning in deviation control.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

A person undertaking this unit of competency would be expected to demonstrate the ability to:

- test, repair, recommission and monitor the operational condition of electrical systems and equipment utilised within the industry
- communicate and report the operational condition and history of electrical stems to other team members and company personnel
- coordinate own work and the work of others, including on site contractors/operators.

It is essential to be able to apply the underlying skills and knowledge contained within this competency across a range of electrical systems and equipment.

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Demonstrate working knowledge and application of:

- company-specific work organisations and workflow.
- test equipment typically used with electrical system repair or maintenance.
- process and plant schematic and electrical schematic diagrams
- operations and functions of electrical systems and equipment
- test and calibration methods
- test equipment typically used with electrical systems and equipment.

It is essential to be able to apply the underlying skills and knowledge contained within this competency across a range of electrical systems.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

Critical aspects for assessment and evidence required to demonstrate

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring

EVIDENCE GUIDE**competency in this unit**

action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Also confirm that the person undertaking this competency has the ability to:

- implement all OHS and environmental procedures relevant to this unit
- apply the permit to work system within the context of this unit
- interpret a range of process and system control drawings and schematics in order to undertake required or identified repairs/modifications to electrical systems.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Context of and specific resources for assessment

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

EVIDENCE GUIDE	
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with relevant OPS units.
Guidance information for assessment	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	
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.	
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Applicable Australian standards/legislation	Applicable Australian standards/legislation may include: • OHS legislation • utility codes and standards • AS 2885: Pipelines - Gas and liquid petroleum • AS 2430.1-1987: Classification of hazardous areas - Explosive gas atmospheres • AS 1768-1991: Lightning protection • AS1596-1997/Amdt 1-1999: Storage and handling of Liquefied Petroleum Gas • AS 1697-1987: Gas transmission and distribution systems (known as the SAA Gas Pipeline Code) • AS 2832.1:1998: Cathodic protection of metals - Pipes and cables • AS 3000:2000: Electrical installations (known as the Australian/New Zealand Wiring Rules) • AS 2239-1993: Galvanic (sacrificial) anodes for cathodic protection.

RANGE STATEMENT	
Electrical equipment	Electrical equipment may include: • voltage regulating equipment • battery banks, eg nicad, lead acid • solar generating equipment • alternators, generators and motors • uninterrupt power supplies (UPS) • control panels • lighting • air conditioning • power tools and electrical leads • SWER lines.
Electrical systems	Electrical systems may include: • emergency shutdown systems • fire systems • solar systems • utility systems • uninterrupt power supply systems • low voltage power systems • SWER line systems • communications systems.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence. Persons are required to have skills in hazard identification, assessment and application of control measures.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also

RANGE STATEMENT	
	includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Test equipment	Test equipment may include: • multimeter • chart recorders • data logging equipment • amp and volt meters • watt meters • high voltage testing equipment • earth leakage test equipment • electrical inspection tags. The use and operation of personal computers, other hardware mediums and associated software is required.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite Units		

PMASUP343B Monitor and maintain cathodic protection systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario the operations technician conducts the maintenance and monitoring of pipeline cathodic protection (CP) systems and routine operations normally conducted on those systems. The technician is required to carry out prescribed inspections and monitoring activities as detailed in procedures and compile reports, outlining results, including identified system anomalies.

Application of the Unit

Application of the unit	Generally the operations technician would operate independently and be expected to be capable of performing all parts of this unit, however they may be part of a team during critical inspections or maintenance operations. At all times they would be liaising and cooperating with other members of the team. The operations technician will: • monitor CP systems • retrofit components that test faulty • optimise system outputs • identify and rectify operational problems diagnose and troubleshoot problems. AS 2885 Part 3 applies as the principle reference standard for this competency. This unit has no prerequisites. However, under some circumstances electrical licences or restricted electrical licences may be required. Local regulations need to be checked for details.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare and organise operational and maintenance activities	1.1. Review previous reports and check for outstanding work orders or notices 1.2. Assemble necessary equipment and plan maintenance activities 1.3. Take readings at regular intervals from CP system monitoring/test equipment and interpret collected data 1.4. Identify CP faults and notify appropriate personnel 1.5. Compile reports based on the collected data and analyse to determine system maintenance and operational adjustments to optimise system integrity.
2. Monitor and adjust electrical equipment	2.1. Monitor equipment operating parameters to ensure operation within relevant Australian Standard specifications and make adjustments as required 2.2. Operate cathodic protection equipment in accordance with the principles of cathodic protection impressed current/corrosion systems 2.3. Maintain CP system at maximum efficiency within

ELEMENT	PERFORMANCE CRITERIA
	design parameters 2.4. Monitor equipment operating parameters to determine if the correct operating conditions of the equipment are being maintained 2.5. Collect and interpret data and determine maintenance requirements 2.6. Conduct regular inspections to ensure equipment integrity is maintained and results are recorded and any system abnormalities identified 2.7. Carry out adjustments and maintenance to the equipment where abnormalities in the system have been identified.
3. Conduct CP system surveys	3.1. Interpret survey specifications to determine survey path and equipment requirement 3.2. Conduct preparation activities on CP system to enable survey to be carried out 3.3. Conduct CP surveys of the system and log and record results of the survey 3.4. Fault find and diagnose operating CP systems 3.5. Download collected survey data to allow a report to be compiled concerning survey findings.
4. Recommission the system	4.1. Recommission the system to meet system operational requirements 4.2. Restore site to meet environmental and operational requirements 4.3. Compile and update records and drawings to reflect the repair/modification 4.4. Maintain incident records.
5. Analyse and utilise CP data	5.1. Analyse survey report data and findings to determine system abnormalities and maintenance required for the continued operation of the system 5.2. Liaise with appropriate personnel to repair or modify as required, areas/equipment identified for maintenance
6. Control hazards	6.1. Identify hazards in cathodic protection systems 6.2. Assess the risks arising from those hazards 6.3. Implement measures to control those risks in line with procedures and duty of care.
7. Respond to problems	7.1. Identify possible problems in equipment or process 7.2. Determine problems needing action 7.3. Determine possible fault causes

ELEMENT	PERFORMANCE CRITERIA
	7.4. Rectify problem using appropriate solution within area of responsibility 7.5. Follow through items initiated until final resolution has occurred 7.6. Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the CP system and to distinguish between causes of problems/alarm/fault indications such as:

- interference within the system
- instrument failure/wrong reading
- electrical failure
- operational problems.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- company specific work organisations and workflow
- function of cathodic protection systems and cathodic protection equipment
- CP systems, monitor and adjust related electrical power systems
- function of solar powered power generation systems
- operations of 240V power generation systems
- insulation and monolithic joints.

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and

EVIDENCE GUIDE	
Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of the CP systems and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are

EVIDENCE GUIDE	
	recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: • <i>PMASUP342B Monitor and maintain electrical systems</i> • <i>PMAOPS230B Operate, monitor and maintain pipeline facilities/equipment</i> • <i>PMASUP243B Monitor and maintain pipeline coatings</i> • <i>PMASUP236B Operate vehicles in the field.</i>
Guidance information for assessment	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
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

RANGE STATEMENT	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the CP system. For your plant/pipeline this may include: • solar powered power generation systems • 240V power generation systems • CP system interrupters • insulation and monolithic joints • galvanic anode beds • battery banks - nicad and lead acid • transformer rectifiers and CPUs • lightning protection equipment • CP test points • Kirk cells.
Types of CP problems	Types of CP problems may include: • coating damage/deterioration • interference from other systems • anode not working • incorrect current output from CPU/TR unit • equipment fault/failure.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets

RANGE STATEMENT

	• temporary instructions • any similar instructions provided for the smooth running of the plant. • For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMASUP344B Monitor and control repairs and modifications on operational pipe

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario an operations technician is responsible for ensuring that all modification and repair activities conducted on an operational pipeline system are carried out in accordance with approved procedures and specifications. In particular this refers to the individual monitoring and operating the pipeline system to enable the welding, cutting, repair/modification activities to be carried out, followed by the reinstatement of the pipeline system after the task has been completed.

Application of the Unit

Application of the unit	Generally the operations technician would be part of a team. They would be expected to be capable of performing all facets of the competency whilst following site specific procedures. At all times they would be liaising and communicating with relevant team members. The operations technician would: • ensure the nature of the intervention was clearly understood before work commenced • make certain the site was accessible and safe and that a work permit had been issued • monitor the conducting of appropriate tests on the modification/repair and verify the modification/repair was safe before recommissioning the pipeline system • recommission the pipeline system after the work and testing was completed. AS 2885 Part 2 and Part 3 form the principle reference standard for this competency.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare and plan for pipeline repair or modifications	1.1.Examine the work area and ensure there is adequate access to the affected section of the pipeline 1.2.Identify any on-site hazards or irregularities 1.3.Obtain plans, instructions, relevant codes and drawings of proposed works 1.4.Ensure pipeline repairers are aware of site hazards and confirm that a permit to work has been issued 1.5.Convey information concerning the identified repair/modification to all parties concerned with the repair 1.6.Inform third parties of the need for access to the site as necessary.
2. Monitor pipe welding, cutting and fabrication	2.1.Ensure the pipeline system is prepared in accordance with procedures and made safe for work to commence

ELEMENT	PERFORMANCE CRITERIA
	2.2. Monitor the work to ensure that welding, stoppling or modifications are carried out according to the approved work plan 2.3. Verify that the necessary inspection and testing is conducted on the repaired or modification area 2.4. Confirm that test results are valid and that the work has been conducted to specification 2.5. Facilitate site clean up to remove waste materials and debris and restore the site to original condition 2.6. Sign off the permit to work at the completion of the work 2.7. Ensure that all environmental obligations are met.
3. Recommission pipeline	3.1. Contact the control centre and advise when repairs are completed successfully and arrange for the system to be brought back on line 3.2. Where the line has been manually isolated restore pipeline operation when authorised to do so 3.3. Inspect the area of the pipeline subject to the permit to work for any sign of leakage or defects 3.4. Confirm the pipeline is holding pressure and the system is meeting operational requirements.
4. Complete reports and documentation	4.1. Complete site reports and documentation as required by regulatory bodies or company procedures 4.2. Ensure site drawings are updated to show accurate location of repair or modification 4.3. Liaise with relevant company departments to ensure all records and drawings are updated to reflect the repair/modification.
5. Control hazards	5.1. Identify hazards in the pipeline system work area 5.2. Assess the risks arising from those hazards 5.3. Implement measures to control those risks in line with procedures and duty of care.
6. Respond to problems	6.1. Identify possible problems in pipeline or process 6.2. Determine problems needing action 6.3. Determine possible fault causes 6.4. Rectify problem using appropriate solution within area of responsibility 6.5. Follow through items initiated until final resolution has occurred 6.6. Report problems outside area of responsibility to

ELEMENT	PERFORMANCE CRITERIA
	designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of problems to an item of equipment within the pipeline system and to distinguish between causes of problems/alarm/fault indications such as:

- leakages
- blockages
- instrument failure
- mechanical failure
- ice formation
- flow variations.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- welding and cutting techniques on operational pipeline systems
- hot tap and stoppling techniques
- inspection techniques
- pipeline codes and standards
- pipeline drawings and plans
- the operation of pipe cutting equipment
- the operation of lifting and moving equipment
- fitting of pipeline repair clamps and sleeves
- safety systems and procedures
- quality assurance system requirements
- excavation of pipelines
- emergency response plans 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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual pipeline and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training. This unit of competency requires an application of the knowledge contained in the use of the pipeline system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment/processes needing attention or with potential problems are recognised • the range of possible causes can be identified and

EVIDENCE GUIDE	
	analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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
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.

RANGE STATEMENT	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the pipeline system. For your system this may include: • non-destructive testing equipment, including radiographic, dye penetrant, ultrasonic and others • pipe cutting and repair equipment • air/gas movers • lifting equipment • plans and drawings • hand and power tools.
Typical problems	Typical problems for your system may include: • lifting equipment failures • fire and explosion • burns • atmospheric hazards • manual handling hazards • static electricity.
Appropriate action	Appropriate action includes: • determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.

RANGE STATEMENT**Health, safety
and
environment
(HSE)**

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP345A Monitor vibration

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers undertaking condition monitoring.

Application of the Unit

Application of the unit	This unit applies where specialist monitoring activities are undertaken as part of a preventive maintenance or total productive maintenance plan or program. Work is undertaken autonomously or as part of a team environment. Monitoring is undertaken in workshop, laboratory or in situ environment; readings are undertaken to the accuracy of monitoring equipment limitations or to site specifications where applicable. Results are recorded/plotted to predetermined procedure and technique. All work and work procedures are undertaken to standard operating procedures and/or equipment manufacturer recommendations. All work and work practices are undertaken to regulatory or legislative requirements.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Undertake condition monitoring.	1.1.Principles and methods of equipment condition monitoring are understood and applied 1.2.Appropriate condition monitoring technique is selected to achieve required outcomes. 1.3.Checks are undertaken correctly, safely and to standard operating procedures. 1.4.Results are plotted and deviations from specification are reported to appropriate authority and recorded.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
- recording results - preparing and submitting deviation reports.
Required knowledge
Look for evidence that confirms knowledge of: the application of principles and methods for a variety of situations

REQUIRED SKILLS AND KNOWLEDGE

- appropriate records for a variety of situations
- hazards and control measures associated with equipment monitoring, including housekeeping
- use and application of personal protective equipment
- safe work practices and procedures

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include a range of problems, problem causes and environments.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual problems and should include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios.

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

Competence must be demonstrated in the ability to define and analyse the problem as well as deal with the stakeholders. The stakeholders should be satisfied with the solution, as well as the solution being technically sound.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and

EVIDENCE GUIDE	
	analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the equipment, incidents on similar equipment around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	As a general rule assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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
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.

RANGE STATEMENT	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes monitoring equipment, including: • built-in systems (software and site displays) • portable meters or devices • vibration monitors • infra-red and ultra-violet, non-destructive testing
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP346A Control corrosion

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the control of corrosion in plant, equipment and/or pipelines (plant) by the use of chemical (or biological) controls. For cathodic protection see <i>PMASUP343B Monitor and maintain cathodic protection systems</i> .

Application of the Unit

Application of the unit	In a typical scenario a technician will monitor plant for signs of corrosion and or monitor the concentration of inhibiting chemicals or similar. They will maintain an appropriate dosing regime in order to control the rate of corrosion. Generally the operations technician would operate independently and be expected to be capable of performing all parts of this unit, however they may be part of a team during critical inspections or maintenance operations. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify corrosion controls in use.	1.1. Identify sites susceptible to corrosion on work area 1.2. Explain the causes and effects of corrosion at these sites 1.3. Identify the corrosion inhibitor(s) used in work area 1.4. Determine hazards associated with corrosion and corrosion control 1.5. Control hazards associated with corrosion and corrosion control 1.6. Coordinate with appropriate personnel.
2. Dose corrosion inhibitor.	2.1. Monitor indicators of rate of corrosion as required 2.2. Monitor inhibitor dosing equipment as required 2.3. Adjust rate of dosing as required by procedures 2.4. Monitor inhibitor stocks as required 2.5. Recognise situations requiring action 2.6. Take appropriate action.
3. Test plant for corrosion as required	3.1. Identify corrosion testing methods used in work area 3.2. Complete testing activities as required by procedures 3.3. Examine test results and take appropriate action
4. Isolate and de-isolate dosing plant.	4.1. Isolate dosing plant 4.2. Make safe for required work 4.3. Check dosing plant is ready to be returned to service 4.4. Prepare dosing plant for return to service.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
• efficient and effective operation of plant/equipment • hazard analysis • completing plant records • communication • problem solving.
Required knowledge
• the galvanic series • electrochemical corrosion • types of corrosion/causes of anode formation • factors controlling the rate of corrosion • types of corrosion inhibitors used and their action • hazards associated with corrosion inhibitors and relevant hazard controls • costs and hazards of corrosion • principles of operation of dosing equipment • physics and chemistry relevant to the process unit and the materials processed • process parameters and limits, eg temperature, pressure, flow, pH • duty of care obligations • hierarchy of control • routine problems, faults and their resolution • relevant alarms and actions • plant process idiosyncrasies • all items on a schematic of the plant item and the function of each • correct methods of starting, stopping, operating and controlling process • corrective action appropriate to the problem cause • function and troubleshooting of major components and their problems • types and causes of problems within operator's scope of skill level and responsibility.

Evidence Guide

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the corrosion control systems and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined

EVIDENCE GUIDE	
	• appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.
Guidance information for assessment	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	
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.	
Codes of	Where reference is made to industry codes of practice, and/or

RANGE STATEMENT	
practice/standards	Australian/international standards, the latest version must be used.
Context	This unit of competency includes all such items of equipment and unit operations which form part of the corrosion control system. For your plant/pipeline this may include: • dosing pumps • flow rate controllers • analytical instrumentation related to corrosion • head tanks • test coupons or similar • brushes • inspection devices This unit does not include the operation of smart pigs - see <i>PMAOPS335A Conduct pipeline pigging</i>.
Work area	Work area refers to the systems or units the technician is responsible for and may be a plant area, a well head or pipeline covering thousands of kilometers.
Corrosion	Corrosion typically refers to any electrochemical process leading to the decay of metal. It may also be applied to decay processes in non-metals if appropriate.
Corrosion inhibitors	Corrosion inhibitors for metals are typically amines but may include: • anodic or cathodic inhibitors • film formers • oxygen scavengers • pH adjusters/buffers • biocides • additives and carriers such as: • solvent base • surfactants • dispersants • demulsifiers • de-foamers • other materials.
Inhibitor dosing	Inhibitor dosing may be continuous or batch injection of corrosion inhibitor to the plant.
Appropriate	Appropriate action includes:

RANGE STATEMENT	
action	• determining problems needing action • determining possible fault causes • rectifying problem using appropriate solution within area of responsibility • following through items initiated until final resolution has occurred • reporting problems outside area of responsibility to designated person.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP347A Undertake corrosion inspection in a petrochemical environment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency concerns the identification of corrosion using corrosion inspection equipment and techniques and recommending appropriate actions to mitigate the problem.

Application of the Unit

Application of the unit	In a typical scenario, operators, in a petrochemical environment are able to: • identify corrosion inspection equipment; • use corrosion inspection equipment; and • use documentation and reporting procedures.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify corrosion inspection equipment.	1.1. Identify corrosion inspection equipment that meets site specific requirements 1.2. locate corrosion inspection equipment according to site specific applications 1.3. Explain the functions of site corrosion inspection equipment
2. Use corrosion inspection equipment.	2.1. Assess conditions to determine the need to use corrosion inspection equipment 2.2. Select corrosion inspection equipment related to site specific conditions in accordance with site requirements 2.3. Operate corrosion inspection equipment in accordance with plant procedures and manufacturer's instructions 2.4. Identify and apply safety procedures relating to corrosion inspection techniques according to site requirements
3. Use documentation and reporting procedures.	3.1. Use documentation and standards for corrosion inspection equipment reporting according to regulatory and site requirements 3.2. Use general equipment documentation and relevant information to site specific requirements 3.3. Complete records and documents according to site procedures
4. Control hazards.	4.1. Identify hazards in the use of the equipment 4.2. Assess the risks arising from those hazards 4.3. Implement measures to control those risks in line with procedures and duty of care.
5. Resolve problems.	5.1. Identify possible problems in equipment or process 5.2. Determine problems needing action 5.3. Determine possible fault causes 5.4. Rectify problem using appropriate solution within area

ELEMENT	PERFORMANCE CRITERIA
	of responsibility 5.5. Follow items initiated through until final resolution has occurred 5.6. Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to isolate the causes of corrosion problems and to recommend appropriate actions to mitigate the problem. The skills to achieve this include:

- inspection and monitoring techniques
- ability to take accurate measurements
- ability to determine the nature and origins of corrosion discovered in monitoring
- safe working methodologies to avoid injury
- ability to undertake complex calculations
- ability to recognise unsafe situations.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- causes of corrosion
- nature and types of corrosion
- areas in which corrosion can occur
- inspection and monitoring techniques
- appearance of corrosion on carbon and alloy steels
- corrosion rate estimations
- effects of variables, eg temperature, climate/environment, humidity
- mitigation methods.

Evidence Guide

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg Elements 1 and 3). Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems.

This unit of competency requires an application of the knowledge contained in the operation of the remote facility and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are

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	recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	Consider co-assessment with other units relevant to the job.
Guidance information for assessment	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	
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.	
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This unit of competency includes such structural and equipment items

RANGE STATEMENT

	which form part of the remote facility. For your enterprise this may include (select relevant items): • valves • pumps • prime movers • compressors • separators • piping, tubing or ducting • storage tanks or cylinders • structural steelwork • wellheads Typical problems for your plant may include: • pitting and scaling • internal and external wall thinning • crack formation
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP410B Develop plant documentation

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the development, establishment and evaluation of plant documentation in response to identified information requirements including the development of workplace documents for the introduction of new systems, processes, equipment and record keeping requirements. The competency unit applies to a wide range of plant documentation. This unit does not apply to the participation in reviewing workplace documentation, which is covered by <i>MSAPMSUP210A Process and record information</i>.

Application of the Unit

Application of the unit	Typically, the employee would: • investigate the need for new plant documentation • determine operating principles and best practice in consultation with others • draft plant documentation • validate and modify plant documentation in response to feedback • communicate changes and amendments.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify information need/deficiency.	1.1. Identify the need for documentation in accordance with company requirements 1.2. Evaluate current documentation where existent 1.3. Define information need/deficiency 1.4. Discuss information requirements with appropriate personnel.
2. Develop plant documentation.	2.1. Specify information need and set/prioritise objectives 2.2. Analyse existing documentation/records in accordance with specified requirements 2.3. Determine operating principles and best practice where required 2.4. Develop/amend documentation as a draft in accordance with specifications to standard format 2.5. Issue documentation to appropriate personnel for review 2.6. Edit documentation and amend in accordance with review requirements 2.7. Complete documentation to satisfy the initial identified need/deficiency.
3. Communicate changes to plant documentation.	3.1. Explain and communicate documentation to all relevant personnel 3.2. Distribute documentation to all appropriate personnel 3.3. Evaluate implementation of documentation

ELEMENT	PERFORMANCE CRITERIA
	3.4. Amend documents if required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
Competence, sufficient to be able to develop and amend work place documentation, includes the ability to apply and explain: • enterprise information systems and work place documentation • enterprise quality and safety procedures • principles of policy and procedure development • principles of information/data management • importance of effective consultation in developing documentation • relevant equipment and operational processes.
Required knowledge
The knowledge referred to in the Evidence Guide for this unit includes: • organisation policies, standard procedures and work instructions and relevant regulatory requirements for the development of plant documentation • standard codes of practice relevant to developing plant documentation.

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, the Range Statement and the Assessment Guidelines for the Training Package.
Overview of assessment
Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

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	Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Assessment will typically use a plant documentation development project. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of satisfactory performance in this unit can be obtained by observation of performance and questioning to indicate understanding and knowledge of the Elements of the competency and Performance Criteria. Consistent performance should be demonstrated. In particular look to see that: • effective maintenance and evaluation of workplace documentation is carried out • effective research and consultation is undertaken to ensure the development of best practice documentation • feedback is provided on how to improve workplace documentation • completed documentation is user friendly, accurate and in accordance with the intended use/requirements • adequate documentation is produced, including documentation for the introduction of new systems, policies, equipment or processes • non routine problems in relation to plant documentation are recognised and appropriate solutions are presented • changes to workplace documentation is communicated in the appropriate manner. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the

EVIDENCE GUIDE	
	past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency is typically performed by experienced operators, team leaders or supervisors who may be working individually or in a team environment.
Documentation	This competency includes the following indicative plant documentation: - operating procedures - work instructions - incident procedures - operating manuals - quality manuals and procedures

RANGE STATEMENT	
	• training program contents/materials • safety data sheets • job cards • maintenance logs • non-compliance reports • incidence and accident reports • permits • schematics/process flows/engineering drawings.
Information	Sources of information may include: • manufacturing specifications • product specifications • company policies and procedures • customer requirements • industry/work place codes of practice • State/industry OHS legislation and regulations • ISO and other industry standards and regulations • industry associations, networks and professional bodies.
Equipment	Items of equipment for this competency include: • computer equipment.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP420B Minimise environmental impact of process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers minimising waste and environmental threats from a plant and/or a process. It covers all resources used and products made by the plant, and is performed by more experienced operators who might be expected to develop and implement improvements to processes within the plant. This unit may be performed individually or as part of a team. This competency also applies to capital projects, as well as improvements brought about by changes in work practices and procedures

Application of the Unit

Application of the unit	In this competency, an operator would develop practices or procedures for: • conserving resources • minimising pollution • minimising waste. This requires the operator to have a good understanding of the resources used by the plant, the nature and source of pollutants and the waste materials produced by the plant. It also requires the operator to understand the impact of using resources, and the effect pollutants and waste can have on the local environment. When developing a process or practice, the operator would identify which resource, pollutant or waste product that if reduced would give the most benefit. After developing procedures to conserve resources or minimise pollution/waste produced by the plant, the operator would then document the procedures to implement the changes.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Develop resource conservation practices and/or procedures.	1.1. Identify the nature of resources used in the plant/process 1.2. Determine the primary source of these resources 1.3. Describe the impact of the depletion of these resources on the environment and society 1.4. Determine which resource(s) will yield a greater benefit from their conservation 1.5. Develop methods to reduce the consumption of these resources 1.6. Complete required documentation to implement change
2. Develop pollution minimisation practices and/or procedures.	2.1. Identify the nature of pollutants produced by the plant/process 2.2. Determine the source(s) of these pollutants within the plant/process 2.3. Describe the impact of these pollutants on the environment and society 2.4. Determine which pollutant(s) will yield a

ELEMENT	PERFORMANCE CRITERIA
	greater benefit from their reduction 2.5. Develop methods to reduce the production of this pollutant 2.6. Complete required documentation to implement change.
3. Develop waste minimisation practices and/or procedures.	3.1. Identify the nature of wastes produced by the plant/process 3.2. Determine the source(s) of these wastes within the plant/process 3.3. Describe the impact of these wastes on the environment and society 3.4. Determine which waste(s) will yield a greater benefit from their reduction 3.5. Develop methods to reduce the production of this waste 3.6. Complete required documentation to implement change.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence to also include the ability to apply and explain:

- nature and severity of potential environmental hazards caused by the plant/process
- sensitivity of local environment to these environmental threats
- pathways of entry to the environment from the plant
- regulatory requirements such as environment protection regulations, OHS, HAZCHEM, duty of care, dangerous goods
- external licensing requirements such as EPA, water authorities, local councils
- enterprise procedures and practices.

Required knowledge

Knowledge and understanding of the control of environmental incident process and the importance of critical parameters enough to minimise waste and environmental threats from a plant and/or a process within an organisation.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Assessment of this unit may be best achieved with a suitable project. This will minimise possible impact on the environment caused by the process or some aspect of the process. Such a project may be regarded as adequate provided it meets all the Performance Criteria of at least one Element. It is not necessary to cover all elements.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- procedures are developed to reduce the consumption of resources, or to minimise pollution and/or waste products
- appropriate documentation is completed to

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	implement changes the greatest yield is achieved by appropriate selection of type of resource usage, type of pollutant or waste product. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with: Competency units relevant to the type of process equipment. In a major hazard facility, it may be appropriate to assess this unit concurrently with OHS units.
Guidance information for assessment	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
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

RANGE STATEMENT	
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.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency is performed by more experienced operators and may be performed individually or as part of a team. It includes the following indicative functions: • examining plant records • examining operating procedures and practices • liaising with a range of internal people • modifying/updating standard operating procedures to 'lock in' any changes. Typical objectives will include: • minimisation of waste • maximisation of product yield from raw materials • reduction in volume of pollutants made • reduction in concentration/intensity of pollutants made • reduction in emissions. All operations are performed in accordance with standard procedures and policies.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMASUP432B Coordinate pipeline projects

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario, the person is involved in the efficient coordination of projects on pipeline systems and facilities. Typical projects may include: • installation of new plant piping and equipment • pipeline repairs and modifications • upgrades of existing plant, piping and equipment • commissioning of pipelines and facilities • construction and upgrade of pipeline easements.

Application of the Unit

Application of the unit	The person would: • prepare scoping documents, specifications and/or tenders • manage the project through the construction and commissioning phases • liaise with other staff, contractors, and authorities as required • ensure that the project conforms with all of the necessary safety requirements. Generally the person would be part of a team during the whole project and would perform all parts of this unit. At all times they would be liaising and cooperating with other members of the team. This unit does not require the operation of a central control panel.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare project specification documents.	1.1. Analyse the proposed project to establish contract specifications 1.2. Conduct a documented hazard and risk assessment on the proposed project, identifying all potential hazards and risks 1.3. Draft specification documents stating the required work activity and health, safety and environmental requirements 1.4. Seek tenders for the specified works, review as per the relevant company procedure and appoint a winning tenderer.
2. Prepare project schedule and documentation.	2.1. Draft a project schedule to establish project timeframe, work activities and procurement of materials 2.2. Apply the job safety analysis process to specific project activities reflecting any health, safety and environmental issues identified in the project risk and hazard assessment 2.3. Write procedures and work instructions for project work activities from the outcome of the job safety analysis process.
3. Conduct induction training for project.	3.1. Discuss company/site specific procedures and health, safety and environmental requirements with contractors/employees

ELEMENT	PERFORMANCE CRITERIA
	carrying out the specified works 3.2. Assess all persons who are inducted to ensure they understand the company/site procedures and health, safety and environmental requirements 3.3. Inspect all equipment and machinery utilised to carry out the works to ensure these comply with company/site requirements.
4. Monitor progress of project.	4.1. Purchase materials required for fabrication and installation on the project and inspect to ensure all items meet project specifications 4.2. Monitor project works to ensure activities are carried out to project specification and minimal impact occurs on existing operations and environment 4.3. Issue permits to work where project activities impact on existing pipeline operations 4.4. Amend and/or modify original specifications and communicate to all parties involved as per the relevant company procedure 4.5. Produce project reports updating project schedule progress, activities and health, safety and environmental issues, and discuss with all parties involved 4.6. Draft operations manuals and compile vendor data manuals to assist in the operation of the equipment/facility after project completion.
5. Complete and commission project.	5.1. Commission the project to ensure all work carried out meets project specifications and operational requirements 5.2. Restore the project site to meet environmental and operational requirements 5.3. Cancel permits to work and sign off at completion of works 5.4. Check all documentation, records and drawings pertaining to the project, verify for accuracy and hand over to the relevant operational department.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

The ability to coordinate project activities and report on project status would be considered as a critical component of this unit.

Required knowledge

Demonstrated working knowledge and application of company-specific work organisations and workflow would be highly regarded.

Demonstrated knowledge of process and pipeline equipment is essential in underpinning a person's competency in this unit including:

- architecture of pipeline systems and facilities
- pipeline operations knowledge
- pipeline system operating parameters
- quality assurance systems and plans
- emergency response plans 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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment for this unit of competency will be using a pipeline project. Where it is not appropriate to use an actual pipeline project, then a simulated project may be used. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on an actual project and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through

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	questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of items needing attention or with potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to plan. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants
Context of and specific resources for assessment	Assessment will require access to a project over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, OHS and communication units. Consider co-assessment with: • <i>PMASUP242B Monitor pipeline civil works</i> • <i>PMASUP241B Maintain pipeline easements.</i>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the

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work being performed.

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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency includes all of the interactions necessary to plan, implement and complete a pipeline project, including the following aspects: • Provision of legislative requirements and information: • OHS laws and codes of practice • guidelines for preparation and submission of safety cases • pipeline licenses • environmental statutes and standards. The use and operation of personal computers, other hardware mediums and associated software is required.
Authorities	Authorities may include: • Environmental Protection Authority (EPA) • Department of Primary Industry and Energy (DOPIE) • Departments of Minerals and Energy State and Territory • Worksafe.
Inspection and testing	Inspection and testing techniques may include: • hydrostatic testing • magnetic particle inspection • radiography • ultrasonic inspection • dye penetrant inspection.
Repair/modification	Repair/modification techniques may include:

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techniques	• hot tap and stoppling operations • welding and cutting operations.
Reports	Reports may include: • budget updates • hazard and incident reports • safety statistics report • project schedule progress report • materials and spares listings.
Australian standards	Applicable Australian standards may include: • AS 2885 • AS 4041 • AS 3000.
Plans and drawings	Plans and drawings may include: • pipeline alignment drawings • process and instrument drawings • workshop fabrication drawings.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP441C Decommission plant

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the decommissioning of an existing plant/pipeline or major plant area, and its associated equipment. Decommissioning refers to the removal from service of plant/pipeline and equipment and its storage/'mothballing' or disposal. This unit does not cover the shutdown of a plant/pipeline - use <i>PMAOPS411B Manage plant shutdown and restart</i>.

Application of the Unit

Application of the unit	In a typical scenario, an existing plant/pipeline or major plant area, and its associated equipment, are planned to be taken out of service. The experienced technician organizes the systematic shutdown, cleaning out and preparation for safe 'moth-balling' all of the plant and equipment. This competency is typically performed by experienced technicians, likely to be the leaders of an operational team, usually working in conjunction with a decommissioning team, for the purpose of decommissioning plant/pipelines. As decommissioning is usually a team activity, the technician will take a lead technical role, rather than undertake all aspects on an individual basis. Much of the activity of successful decommissioning is in planning the activity and then supervising the work to ensure it is done safely and efficiently with no environmental damage. The technician may have no 'hands-on' role at all.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Contribute to decommissioning planning.	1.1. Apply process understanding to the planning process 1.2. Identify the role and purpose of the plant and equipment 1.3. Ensure the work is coordinated effectively with others involved on the work site 1.4. Identify process conditions and apply to hazard studies 1.5. Undertake investigations following on from hazard studies 1.6. Obtain materials necessary to complete the work and check against job requirements 1.7. Obtain tools and equipment necessary to carry out the work and check for correct operation and safety 1.8. Prepare plans to ensure that procedures are performed in the correct sequence 1.9. Obtain approvals where necessary from appropriate authorities to ensure decommissioning process proceeds in accordance with the plan. 1.10. Complete all appropriate documentation.
2. Isolate and decontaminate equipment/unit.	2.1. Interpret and apply decommissioning plan 2.2. Identify and use appropriate safety equipment and materials 2.3. Isolate and decontaminate equipment components as required 2.4. Dispose of contaminated materials or components as

ELEMENT	PERFORMANCE CRITERIA
	required 2.5. Complete required documentation.
3. Inspect, test and notify completion of work.	3.1. Select tools and equipment appropriate to the testing/ inspection requirements and utilise in accordance with manufacturer specifications and legislative requirements 3.2. Test/inspect in accordance with requirements 3.3. Ensure compliance with OHS legislative requirements for risk assessment prior to disposal 3.4. Ensure any required additional work is undertaken/initiated 3.5. Notify work completion.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
Demonstrated knowledge and ability to: - plan the decommissioning process - arrange resources as required - coordinate own work and the work of others, including on-site contractors/operators - interpret and solve operational problems as they arise and take appropriate action - document the decommissioning and recommendations for safe storage/maintenance/disposal.
Required knowledge
Competence to include the ability to apply and explain: - chemistry of materials involved - principles of operation of the process - principles of operation of the equipment involved - all items on a schematic of the plant and the function of each - correct methods of, stopping plant items - function of major components - HAZOP study process and the interpretation of findings - results and impact of a HAZAN study - hazardous substances legislation - the process of hazard identification, risk assessment and control

REQUIRED SKILLS AND KNOWLEDGE

- sources of hazard information (such as Material Safety Data Sheets)
- safe disposal methods of materials and equipment
- decontamination 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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant/pipeline and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Simulation may be required to allow for assessment of parts of this unit. It is possible that a simulation will be required to ensure that the technician is competent before taking a significant role in a decommissioning activity. Decommissioning is an infrequent activity and so it may not be practical or equitable to wait for an actual decommissioning to occur to use this as the basis for assessment. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/ scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate, timely action is taken • obvious problems in related plant areas are recognised and an

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	appropriate contribution made to their solution These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to a plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required, as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with relevant OHS units.
Guidance information for assessment	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**

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.

Codes of practice/ standards	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 functions of : - liaison with manufacturers, engineering personnel, designers, maintenance personnel - participation in hazard and operability studies (HAZOP) and hazard

RANGE STATEMENT

	analysis studies (HAZAN) • removal of plant and equipment from service, which may include: • 'mothballing' • storage • disassembly • demolition • decontamination of equipment • disposal of equipment and waste. This competency unit includes the understanding and application of: • OHS regulations especially those related to plant • codes of practice • disposal procedures and regulations. All operations are performed in accordance with standard operating procedures.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units	

PMASUP444A Plan plant preparation and isolation

Modification History

New unit

Unit Descriptor

This unit of competency covers the skills and knowledge needed to undertake the planning and organisation needed before plant is isolated and prepared for subsequent work, typically maintenance of some sort. It also includes the planning to prepare for the plant's return to service.

Application of the Unit

This unit applies to a person who has the responsibility for planning to isolate and prepare plant. This is probably part of their work role, although it could be a full time secondment for a major shutdown. The type of people to whom this unit may apply include (but are not limited to):

- operators and maintainers
- supervisors
- maintenance planners
- maintenance personnel
- authorised permit issuers, coordinators or similar.

While this unit is written to apply to an individual they will rarely if ever complete this competency as a lone individual and will usually do so in liaison with relevant experts and stakeholders.

This unit applies:

- after the work scope has been agreed
- before the isolation and preparation commences.

This unit has a strong relationship with the relevant 'permit' units (e.g. MSAPMPER300C Issue work permits) as well as HAZOP (e.g. PMASUP445A Participate in HAZOP studies) and decommissioning/recommissioning units (e.g. PMASUP440B Commission/recommission plant and PMASUP441C Decommission plant). Where relevant, these units should also be accessed.

This unit requires a detailed knowledge of the plant to be prepared and isolated, such as might be obtained from the relevant technical units covering this plant. Hands-on operating competency, however, is not necessarily required.

This unit does not include the actual isolation and preparation of plant – see PMASUP244A Prepare and isolate plant.

This unit has been written with the preparation and isolation of hazardous plant, such as a major hazard facility in mind. However, it should also be applicable to the preparation and isolation of lower hazard plants and mobile plant with appropriate contextualisation.

Much of this unit is iterative and the text below should not be taken as specifying necessary sequence.

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	Confirm scope of work	1.1	Examine identified work scope
		1.2	Confirm purpose of identified work
		1.3	Identify plant and equipment involved
		1.4	Negotiate any conflicts/inconsistencies with relevant stakeholders
		1.5	Identify possible need for temporary lifting of any isolations
2	Develop isolation	2.1	Apply relevant isolation philosophy/strategy

philosophy for work	2.2	Determine implications of isolation
	2.3	Identify physical limits of effected plant and equipment
	2.4	Check suitability and effectiveness of existing isolation procedures
	2.5	Assess possible boundaries for isolations
	2.6	Seek local knowledge for similar isolations and preparations
	2.7	Draft strategies for isolation and preparation
	2.8	Communicate, as appropriate, with stakeholders
	2.9	Negotiate isolation and preparation conflicts
	2.10	Prepare isolation philosophy for work
3	Manage hazards	3.1 Identify existing hazards of plant, process and materials
		3.2 Identify hazards associated with performing the isolations and preparation
		3.3 Identify hazards associated with purging/flushing/venting materials
		3.4 Draft strategies for controlling any releases
		3.5 Estimate required preparation durations
		3.6 Make recommendations for improvement in accordance with procedures
		3.7 Liaise with technical experts as required
		3.8 Specify types of isolations and locations of isolations required
		3.9 Specify other required hazard controls
		3.10
4	Plan required	4.1 Determine required sequencing of all steps

isolation and preparation	4.2	Develop isolation procedure	
	4.3	Develop preparation procedure	
	4.4	Develop decontamination procedures	
	4.5	Develop required procedures for plant supplementary systems	
	4.6	Verify procedures against relevant drawings and the plant	
	4.7	Identify and schedule required prework	
	4.8	Determine competencies required to complete planned isolations and preparation	
	4.9	Plan required deisolation and preparation for return to service	
	4.10	Discuss proposed plans with relevant stakeholders	
	4.11	Complete required documentation	
5	Obtain authority to execute plan	5.1	Obtain approval to implement the isolation and preparation plan
		5.2	Obtain approval to implement the deisolation and preparation for return to service plan
		5.3	Acquire hardware and resources for isolation and deisolation and preparation for work and return to service

Required Skills and Knowledge

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

Required skills include:

Ability to:

- read and interpret technical documentation and drawings/graphics
- interpret material safety data sheets (MSDS)
- use appropriate risk assessment tools/risk effect matrices

- calculate vessel inventory
- calculate purging/ventilation times
- calculate required volumes for purging
- calculate required times for ventilation (e.g. to achieve a specified number of turns/volumes)

Required knowledge includes:

Knowledge of:

- work control system for site and organisation
- regulations and other external controls relevant to the proposed work
- isolation philosophy or organisation
- hierarchy of isolations
- fluid hydraulics as applied to draining and purging of vessels
- types of purging and ventilation media and their uses and limitations
- methods and equipment used for purging and ventilation
- physical properties of process materials (e.g. density and viscosity)
- hazardous properties of relevant materials (e.g. process, purging and ventilation materials)
- as low as reasonably practicable (ALARP) concept and methods of achieving it
- vessel chilling causes and controls
- appropriate rates of change for pressure and temperature for vessels and other plant
- organisation's authorisation procedures
-

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria required skills and knowledge range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	This unit should be assessed as holistically as is practical and will generally be assessed using a workplace project as a significant assessment activity.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • develop an appropriate isolation philosophy for the work on a significant item of equipment or plant area • manage relevant hazards • develop an appropriate plan for the required isolations and preparation.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace.

	Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned work • documentation relating to the plant, process and materials • any other materials which would normally be available in the workplace while conducting this activity.
Guidance information for assessment	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

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.

Isolation	Isolation is a process for ensuring no energy or material can enter the isolated area
Preparation	Preparation is a process for ensuring that plant and equipment is in a safe and appropriate condition for the required work. Preparation may include, but is not limited to: • draining • purging • inerting • decontaminating • cleaning • ventilating • controlling atmosphere (e.g. to ensure it is breathable, and is not within the flammable range) • adjusting temperature to make a workable environment

	• adjusting pressure (usually to atmospheric) • ensuring adequate access and egress
Scope of work	Scope of work includes, but may not be limited to: • what work is to be done • where the work will be done • who will be doing the work • when the work needs to be done • why the work is to be done • how the work will be undertaken (tools and techniques) • frequency with which this work is/will be required • duration of work (from beginning of shutdown to back to normal operations)
Relevant isolation philosophy/strategy	Relevant isolation philosophy/strategy will normally be that of the organisation for which the isolations are being done although they could include regulatory or similar requirements and may include, but are not limited to: • types of isolations allowed (e.g. positive, double block and bleed), removal of item (e.g. fuse and spool piece), and single block isolations • lock out/tag out • preparation strategies • types of equipment to be used • purging or other preparation fluids/techniques Strategy will be consistent with relevant external standards, such as: • Government of Western Australia, Department of Commerce, Guidance note – Isolation of plant, 2010 • National Offshore Petroleum Safety Authority (NOPSA) requirements • Major Hazard Facility (MHF) Licence to Operate
Hazards	Hazards will include: • hazards to people, environment and plant • other hazards as relevant to the organisation/facility
Implications of isolation	Implications of isolation apply to both the area of the work as well as upstream and downstream implications and may include, but are not limited to: • upstream and downstream process implications

	• ability to prepare plant once isolated • integrity of plant once isolated and prepared
Controlling releases	Controlling releases to the environment may include, but is not limited to: • preventing any release • containing any release • recovery and reuse or disposal of any release
Physical limits of plant	Physical limits of plant may include, but are not limited to: • temperature/pressure limits of plant and equipment • limits on rates of change of temperature/pressure • suitable steam pressures/temperatures
Strategies for isolation and preparation	Strategies for isolation and preparation may include, but are not limited to: • sequence of isolations and preparations • type of isolation, based on hierarchy of isolations • type of preparations to be used
Hierarchy of isolations	Isolations may be categorised according to a hierarchy of: • positive • proven • unproven
Estimating preparation durations	Estimating preparation durations may include, but is not limited to: • determining inventory in plant to be drained/purged • establishing safe rates of change, such as: • pressurisation • depressurisation • draining • flushing • cooling • heating • calculating required volumes and pressures of flushing/purging venting materials • calculating the time required to drain, flush, purge, depressure, pressure, cool and heat
Isolation procedure	Isolation procedure may include, but is not limited to: • isolation processes

	• isolation list • multiple isolations • temporary lifting of isolations, when and if required • interlocks and will include consideration of: • isolation alternatives • conflicts of isolation
Verifying procedures	Verifying procedures may include, but is not limited to: • checking existing documents which have been used are accurate, current and complete • checking planned isolation points do exist, are accessible, and are suitable for the isolation planned • having a history of providing the isolation desired
Relevant drawings	Relevant drawings may include, but are not limited to: • piping and instrumentation diagrams (P&IDs) • process flow diagrams (PFDs) • process flow sheets (PFSs) • process engineering flow sheets (PEFs)
Required prework	Required prework may include, but is not limited to: • scaffolding • building up/depletion of inventories/work in progress (WIP) • obtaining of supplies • identification tags • lock out kits
Competencies required	Competencies required for isolation and preparation may include, but are not limited to: • electrical (normal) • electrical high voltage and hazardous area • electrical isolation/deisolation • radiation • heights • mobile plant • plumbing • mechanical fitting • permit preparation

Required documentation	Required documentation may include, but is not limited to: • drawings • procedures • marking up existing documents • punch lists • vendor documents/engineering specifications • documentation required by the site work control system (e.g. permits) Documents will conform to the site requirements and document control systems Documents may be: • paper, electronic or other approved form
Authority to execute	Authority to execute includes both the authorisation to proceed and the timing of that execution. Authority will be obtained through the channels required by the organisation/facility. The level of authority required will vary for different types of work, different types of isolation and different plants/facilities

Unit Sector(s)

Support

Custom Content Section

Not applicable.

PMASUP445A Participate in HAZOP studies

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the principles and application for technicians in undertaking hazard and operability studies. It is a systematic method for examining complex facilities or processes to identify actual or potentially hazardous procedures and operations so that they may be eliminated or mitigated. HAZOP studies are performed by a multi disciplinary team that identifies the potential hazards and operating issues with the design, construction and commissioning of equipment and plant. This unit may also apply to other personnel with extensive plant knowledge who are involved in the study as team members.

Application of the Unit

Application of the unit	In a typical scenario an experienced operations technician would be a participant in a multi disciplinary team consisting of operators, engineers, safety and other personnel to review a change in plant, process or equipment to see if the change can cause unforeseen hazards or introduce unexpected operability problems and that the change meets the standards. The operations technician would: • review pipe and instrumentation diagrams • identify possible hazards or operability issues • contribute to the safe and productive operation of the plant • recommend amendments to improve safety and operability of the proposed change • review and amend procedures in relation to the change The operations technician would be an experienced operator of the plant under review and part of a HAZOP study team during all phases of the study, including at the initial concept stage, when the pipe and instrumental diagrams (PID) are available, during construction, installation and commissioning and during operation reviewing and amending procedures. He/she would be expected to be capable of demonstrating competence in all parts of this unit. He/she would be actively participating in all phases of the

	study, liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	<i>PMAOPS280B</i>	<i>Interpret process plant schematics</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify the principles of a HAZOP study	1.1.Explain the purpose of a HAZOP 1.2.Describe the key steps in undertaking a HAZOP study 1.3.Identify the tools used in a HAZOP study 1.4.Describe how key words assist in identifying problems 1.5.Explain how HAZOP studies are applied in the workplace
2. Participate in a HAZOP study	2.1.Identify the purpose and operation of the new/modified equipment/process

ELEMENT	PERFORMANCE CRITERIA
	2.2.Explain the normal operating conditions, method of operation and associated equipment and componentry of proposed change 2.3.Review relevant information to assist in the identification of possible problems 2.4.Process available information to identify potential hazards or operability issues 2.5.Identify potential hazards or operability issues and possible consequences utilising key words 2.6.Assess the risks arising from identified potential hazards or operability issues 2.7.Identify items needing further action 2.8.Review relevant operating and safety procedures 2.9.Recommend possible solutions to minimise risk of proposed change.
3. Complete delegated actions within scope of responsibility.	3.1.Perform delegated actions within area of responsibility 3.2.Follow initiated items through until final resolution has occurred 3.3.Identify problems needing further action 3.4.Determine possible fault causes within area of responsibility 3.5.Report outcomes to designated person.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

This competency includes the following skills:

- analysis
- communication
- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies

REQUIRED SKILLS AND KNOWLEDGE

- product parameters (temperature, flows, pressure and levels)
- process control system malfunction
- power/utility failures.
- An ability to operate the plant under review is considered to be an essential element of this unit of competency.

Required knowledge

The knowledge referred to in the evidence guide for this unit includes:

- the architecture and location of the process/production equipment
- specific plant process operations
- interactions between plant items/processes
- product specifications and tolerances
- systems operating parameters
- system integrity limits
- process control philosophies and strategies
- emergency shutdown procedures
- process specific physics, chemistry and mathematics
- basic science of upstream and downstream processes
- impact of external factors (eg variations in weather, feed)
- process drawings (eg P&ID, PFD, cause and effect)
- basis of control for the plant/s
- instrumentation and control systems, components and loops as they relate to the modification under review
- impacts of changing process/production equipment settings and the limits within which changes can be made
- organisation procedures
- OHS, hazardous substances and environmental requirements
- thorough knowledge of enterprise standard operating procedures, plant processes and equipment for area under review

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, the Range Statement and the Assessment Guidelines for the Training Package.

EVIDENCE GUIDE**Overview of assessment**

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units 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.

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg elements 1-2). Simulation should be based on an actual HAZOP study relevant to the plant and may include the use of case studies/scenarios and role plays.

This unit of competency requires an application of the knowledge contained in the use of the process control system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responses. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- key words are utilised in the identification of potential hazards or operability issues
- possible consequences are identified and explained
- risks are assessed from identified potential hazards or operability issues
- appropriate contribution is made to the identification of potential hazards and operability issues and risk assessment.

EVIDENCE GUIDE	
	These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations, which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.
Context of and specific resources for assessment	Assessment will require access to HAZOP tools and relevant plant documentation or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, communication and leadership units.
Guidance information for assessment	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	
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 italicized 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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards AS61882, the latest version must be used.
Context	This unit of competency includes all relevant information and plant and equipment that might be required for the HAZOP study. This may

RANGE STATEMENT	
	include (select relevant items): • provisional layouts • material safety data sheets • process drawings (eg P&ID, PFD, cause and effect) • plant model • equipment arrangement drawings • provisional operating instructions/procedures • plant operating procedures • logic diagrams • equipment reference manuals • hazardous area layouts • start up and shut down emergency procedures • access to plant and equipment. Typical HAZOP study for your plant may include: • purpose of new equipment/plant • how the design will cope with abnormal conditions • identification of potential hazards and operating issues.
Designated action	Designated action may include: review of plant operating procedures undertaking additional tasks from action list HAZOP report attendance at HAZOP review meetings recording results from additional tasks.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP520B Review procedures to minimise environmental impact of process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the minimisation of waste and environmental threat by a plant and/or a process. It covers all resources used and products made.

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of	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

ELEMENT	PERFORMANCE CRITERIA
1. Establish procedures for environmental management.	1.1. Establish workplace procedures of proactive environmental management which include resource conservation, pollution and waste minimisation 1.2. Determine primary source of respective aspects 1.3. Describe the negative impact of these aspects on the environment and the society if they are mismanaged 1.4. Prioritise management options according to the greatest benefit to environment and the society 1.5. Develop management procedures 1.6. Complete required documentation of implement change.
2. Review procedures for environmental management.	2.1. Review the procedures on a regular basis by consulting various work groups for feedback. 2.2. Incorporate relevant feedback into the revised procedures in consultation with the relevant personnel 2.3. Inform relevant work groups of any changes and implement changes in the procedures.
3. Implement and review an environmental management training program.	3.1. Understand the workplace environmental management training program 3.2. Review the program on a regular basis by consulting various work groups for feedback 3.3. Incorporate relevant feedback into the revised program in consultation with the relevant personnel 3.4. Inform relevant work groups of any changes and implement changes in the training program.
4. Implement and review environmental management recording system.	4.1. Understand the workplace environmental management recording system. 4.2. Review the system on a regular basis by consulting various work groups for feedback. 4.3. Incorporate relevant feedback into the revised system in consultation with the relevant personnel 4.4. Inform relevant work groups of any changes and

ELEMENT	PERFORMANCE CRITERIA
	implement changes in the management of environmental records.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- completing plant records
- communication
- problem solving.

Required knowledge

Knowledge and understanding of the control of environmental incident process and the importance of critical parameters enough to establish and review environmental management procedures within an organisation.

Competence includes the ability to apply and explain:

- nature and severity of potential environmental hazards caused by the plant/process
- sensitivity of local environment to these environmental threats
- pathways of entry to the environment from the plant
- regulatory requirements such as:
 - environment protection regulations
 - OHS
 - HAZCHEM
 - duty of care
 - dangerous goods
- external licensing requirements such as:
 - EPA
 - water authorities
 - local councils
 - enterprise procedures and 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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to apply plant and process knowledge to identify and analyse environmental hazards, and establish and review procedures for environmental management.

Consistent performance should be demonstrated. In particular look to see that:

- a holistic 'clean production' approach to waste minimisation is taken
- potential effects on the environment are understood
- terms initiated are followed through until final resolution has occurred
- the process/plant is understood and proposals are capable of implementation
- training needs are addressed
- records are kept.

EVIDENCE GUIDE	
	These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities (eg HAZOP) and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork units, communication units and units relevant to the process equipment. In a major hazard facility, it may be appropriate to assess this unit concurrently with relevant OHS units.
Guidance information for assessment	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	
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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

RANGE STATEMENT	
Context	This competency covers process manufacturing plants which may involve workplace hazards such as: - chemicals and hazardous materials - gases and liquids under pressure - materials handling. This competency includes: - legislation, codes and national standards relevant to the workplace which may include: - award and enterprise agreements and relevant industrial instruments - relevant legislation from all levels of government that effects business operation, especially in regard to OHS, environmental issues and industrial relations - relevant industry codes of practice - awareness of the environment and the effects on the environment of the organisation's: - liquid waste - solid waste - gas/fume/vapour/smoke emissions, including fugitive emissions - hazardous materials - excessive energy and water use - excessive noise and the workplace practices that can be used to minimise or prevent these effects.
Information	Information may include: - organisational policies and procedures - relevant environmental legislation/regulation requirements - licence conditions - environmental treaties, conventions and national policies and strategies - National Pollutant Inventory - State of the Environment reports - voluntary environmental agreements entered into with external organisations/authorities - continuous improvement policies and processes for the organisation.
Work group	Work group may include: formal or unstructured groups

RANGE STATEMENT	
	• two or more people.
Proactive environmental management	Proactive environmental management may include: • resource conservation and efficiency • minimisation of waste • recycling • reduction in use of non-renewable resources • maximisation of product yield from raw materials • reduction in volume of pollutants made • reduction in concentration/intensity of pollutants made • reduction in emissions.
Approaches to proactive environmental management	Some approaches to proactive environmental management may include: • preventing and minimising the production of pollution, eg discharges to air, land and water, hazardous waste • improving housekeeping, eg using a broom instead of a hose, using old rags for cleaning instead of toxic cleaners or water • substituting materials, eg replacing toxic solvent based coatings with water based ones • changing processes, eg mechanical cleaning, re-design of products/ procedures so that materials are used more efficiently.
Environmental management policies	Environmental management policies must be appropriate to the scope and scale of the enterprise and may include: • environmental load reduction and waste minimisation • tenders for the provision of goods and services that specify environmentally preferred selection criteria • protection of land and habitat • environmentally sustainable work practices.
Typical functions	Typical functions may include: • examining plant records • examining operating procedures and practices • liaising with a range of internal people
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP540B Analyse equipment performance

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the analysis of the performance, and performance verification, of existing equipment.

Application of the Unit

Application of the unit	In a typical scenario an experienced technician will set up and operate performance verification trials and then analyse the results to determine actual compared to theoretical performance of equipment and equipment components. It includes: • calculating the theoretical performance of an item of equipment • gathering data to determine the actual performance of the item of equipment • calculation of actual versus theoretical performance • making recommendations as to the appropriate action to be taken based on the performance verification results. This competency is typically performed by a senior technician who will take the lead in the data gathering phase and then analyses the data.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine theoretical performance.	1.1. Identify item of plant or equipment to be analysed 1.2. Locate and interpret design specification 1.3. Identify process materials being processes/to be processed during verification trial 1.4. Determine process material properties under process conditions 1.5. Calculate theoretical performance of component(s) with that material under those conditions.
2. Conduct trial.	2.1. Design verification trial to be compatible with theoretical analysis 2.2. Determine measurements needed from trial to yield required data 2.3. Select equipment suitable to give required measurements 2.4. Arrange for verification trial with relevant process personnel 2.5. Set up required measurement equipment 2.6. Supervise trial and ensure trial conditions are appropriate 2.7. Collect trial data for analysis.
3. Verify performance of plant/equipment.	3.1. Compare theoretical with actual performance 3.2. Determine significance of variation between

ELEMENT	PERFORMANCE CRITERIA
	theoretical and actual performance 3.3. Investigate any suspicious results and take appropriate action.
4. Recommend required action.	4.1. Determine appropriate action to bring performance to desired level 4.2. Initiate the corrective action in accordance with company procedures. 4.3. Determine measures to increase equipment productivity 4.4. Re-check performance after corrective action is implemented.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence, for the practical completion of the job, includes the ability to:

- calculate equipment and component performance from the design specification
- determine equipment and design performance from practical trials
- determine the 'limiting component' in the performance of an item of equipment or a process
- determine possible performance of an item of equipment/process if practical improvements were made to the 'limiting item'.

Required knowledge

Knowledge and understanding of the materials, equipment and process sufficient to predict their interactions and their impacts on performance.

Knowledge of the enterprise procedures and policies along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Knowledge of:

- methods of identifying and calculating theoretical performance
- ways of trialling, trial design and implementation
- methods of data analysis to determine trial outcomes
- methods of interpreting information deduced from trial data.

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, the Range Statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Assessment might typically be by an analysis project. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to carry out the analysis without undue disruption to the process. Consistent performance should be demonstrated. In particular look to see that: • trial design is appropriate • data taken during trial matches that required for the analysis • the analysis is carried out in a structured manner • recommended changes can be justified based on the comparison of trial and theoretical data.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of projects will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

EVIDENCE GUIDE	
	In a major hazard facility, it may be appropriate to assess this unit concurrently with relevant OHS units.
Guidance information for assessment	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	
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.	
Codes of practice/ standards	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 analysis of plant, equipment and equipment components. This competency applies to all work environments and sectors within the chemical, hydrocarbons and oil refining industry, but does require both a theoretical/ mathematical and a practical analysis of the process. The competency does not require a knowledge of industry sectors and materials other than that in which the technician works. It assumes an understanding of the operation of all relevant equipment and processes but does not necessarily require them to be used personally. Typical problems include: - worn equipment/components - validation of new equipment/components to design specification - performance analysis in order to upgrade process performance.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMASUP620B Manage environmental management system

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the scoping, establishment and review of the environmental management system in regard to environmental sustainability as an integral part of business planning.

Application of the Unit

Application of the unit

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	<i>PMASUP520B</i>	<i>Review procedures to minimise environmental impact of process</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to demonstrate

essential outcomes of a unit of competency.	achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Establish an environmental management system.	1.1. Select an appropriate Environmental Management System as a model for the enterprise/plant 1.2. Develop environmental management policies that reflect the organisation's commitment to environmental sustainability as an integral part of business planning and as a business opportunity 1.3. Establish strategies to encourage all stakeholders to meet high standards of environmental performance and support sustainable innovation and continuous improvement 1.4. Establish policies and procedures to incorporate and support triple bottom line principles 1.5. Establish policies/procedures which minimise environmental impacts 1.6. Check policies conform to current regulatory requirements 1.7. Address environmental management at the planning, design and evaluation stages to ensure that any changes in the workplace are identified for ongoing impact and opportunity.
2. Manage innovation and improvement.	2.1. Identify, evaluate and take into consideration changing trends and opportunities relevant to the organisation for ongoing improvement programs 2.2. Promote continuous improvement and sustainable innovation as an essential part of doing business and as a context for assessment and planning of environmental performance 2.3. Establish continuous improvement and innovation policies and procedures that include training and professional development to optimise the environmental performance of the organisation 2.4. Establish a system to analyse and communicate the costs and benefits of innovations and improvements and to measure, monitor and record environmental performance 2.5. Establish performance benchmarks and indicators and set targets to maximise continuous improvement.
3. Review	3.1. Develop processes to ensure that an integrated ongoing

ELEMENT	PERFORMANCE CRITERIA
environmental management system.	review is part of the organization policy and procedures 3.2. Promote improvement and sustainable innovation to organisational performance by ongoing evaluation and assessment, and changes to policies.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication/consultation skills
- conflict resolution skills
- planning and evaluation skills
- process analysis skills
- problem solving skills.

Required knowledge

The person must demonstrate understanding of specialised knowledge with depth in some areas.

Required knowledge is to be limited to that which is sufficient to perform the particular management function and is intended to promote environmental awareness rather than technical environmental competencies. These would include:

- relevant legislation from all levels of government that effects business operation, especially in regard to OHS and environmental issues, EEO, industrial relations and anti-discrimination
- concepts of policy development and business planning
- relevant system analysis and design principles
- performance benchmarking and indicator development relevant to the organisation's activities
- environment sustainability as a 'whole system' approach
- techniques to measure sustainability
- quality systems
- supply chain management
- strategies to maximise opportunities
- environment impact minimisation strategies
- relevant knowledge of environmental issues, especially in regard to water catchments, air, noise, ecosystems, habitat, waste minimisation

REQUIRED SKILLS AND KNOWLEDGE

- relevant knowledge of ecological systems in regard to business operation.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to develop and establish environmental management policies, systems and procedures in regard to managing sustainable business practices while encompassing environmental sustainability as an integral part of business planning.

Evidence must be strictly relevant to the particular management role and is not intended to include detailed technical aspects of environmental science.

Consistent performance should be demonstrated. In particular look to see that:

- communication/consultation skills to ensure all relevant groups and individuals are advised of what is occurring and are provided with an opportunity for input

EVIDENCE GUIDE	
	• conflict resolution skills to mediate, negotiate and/or attempt to obtain consensus between parties • planning and evaluation skills to develop policies and procedures • process analysis skills to identify potential environmental impacts and opportunities • problem solving skills to deal effectively with environmental impacts and opportunities as identified • ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities (eg HAZOP) and similar sources.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork units, communication units and units relevant to the process equipment. In a major hazard facility, it may be appropriate to assess this unit concurrently with relevant OHS units.
Guidance information for assessment	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

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 if the candidate, accessibility of the item, and local industry and regional contexts.	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Triple Bottom Line (TBL) Principle	The 'Triple Bottom Line' (TBL) principle is used as a framework for measuring and reporting corporate performance against economic, social and environmental parameters. It involves the focus of an enterprise being not just on the economic value they add, but also on the environmental and social value they can add.
Sustainable development	Sustainable development is defined as 'Development which meets the needs of the present without compromising the ability of future generations to meet their own needs'. From a business perspective, sustainable development involves the integration of this objective with the need for business growth and expansion. Effective and innovative environmental management can contribute to business growth by reducing costs, differentiating goods and services and contributing to improved corporate image and staff relations.
Environmental performance	Environmental performance may be defined as the measure of an organisation's impact on the environment and their ability to manage and minimise negative impacts.
Legislation, codes and national standards	Legislation, codes and national standards relevant to the workplace which may include: • relevant Commonwealth and State Environment Acts • applicable State environmental regulations • licences and permit conditions • Codes of practice • Australian standards • environmental treaties and conventions • national environmental policies, strategies and initiatives such as the National Greenhouse Strategy, National Strategy for Ecologically Sustainable Development etc. • National Pollutant Inventory • State of the Environment Reports

RANGE STATEMENT	
	- Industry Association commitments (eg The Global Mining Initiative) Environmental management policies must be: - relevant to the organisation's operations - appropriate to the scope and scale of the business.
Environmental Management Policies	Environmental management policies may include: - local, national and international innovations, programs and ideas - business sustainability - environmental load reduction - waste minimisation - tenders for the provision of goods and services that specify environmentally preferred selection criteria - protection of land and habitat - ecological considerations - regeneration of damaged ecosystems - media releases as a result of incidents - environmental reporting - communication strategies to ensure all stakeholders are informed of initiatives and to promote achievements to the wider community.
Knowledge of legislation, codes, national standards, industry codes of practice and workplace policies and procedures	Knowledge of legislation, codes, national standards, industry codes of practice and workplace policies and procedures must: - be strictly relevant to the particular workplace and is not intended to include detailed technical aspects of environmental science - details of legislation must be directly relevant to the workplace - be consistent with the concept that people at this level will be dealing with environmental concepts as part of an overall management responsibility and not as an environmental specialist.
Environmental improvement plans	Environmental improvement plans may be established at management level and may include: - measuring, monitoring and recording environmental performance and continually setting targets for measurable improvements - all aspects of environmental performance including energy and other resources use, waste minimisation, recycling, transport use.

RANGE STATEMENT	
Environmental sustainability	Environmental sustainability may be influenced by: • the organisational culture and operations • internal or external economic climate • political climate • market focus/considerations • environmental impacts of the business operation.
Stakeholders	Stakeholders may include: • board members, financial backers, owners • all members of the organisation, including management and staff members • suppliers • contractors • others acting on the organisation's behalf • customers • external individuals or bodies who may have an interest in or may be affected by the organisation.
Maximising opportunities	Maximising opportunities may involve: • improved environmental performance • increased efficiency • use of alternative energy sources and may improve/enhance: • corporate image • staff morale • cost reduction • product differentiation/branding • identification of market potential.
Environmental impact	To minimise environmental impact may include the minimisation of: • waste/pollution • emissions/spills • use of resources, especially reduction of use of non-renewable resources.
Continuous improvement and innovation policies	Continuous improvement and innovation policies may include: • consistent reviewing activities in search of a better way • improving the organisation in all aspects of its operation • and may look at life cycle impacts of the organisation including:

RANGE STATEMENT	
	- activities and products are designed to minimise life cycle impacts and maximise opportunities - tendering and purchasing processes that include life cycle criteria - product design and manufacture - packaging policies - product use and disposal - vehicle policies that include use of cleaner fuels or alternative energy sources and regular servicing intervals to reduce pollution and improve efficiency.
Performance benchmarks	Performance benchmarks and targets may include: - best practice or industry codes for the industry/sector - levels of performance expected of organisation sectors and/or the organisation as a whole.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		

FDFPHGMP3A Monitor the implementation of Good Manufacturing Practice procedures

Modification History

Not applicable.

Unit Descriptor

This is a Core unit for pharmaceutical processing. It covers the skills and knowledge required to provide a leadership role in supporting day-to-day implementation of Good Manufacturing Practices (GMP) in a work area. It also involves supporting others to implement the requirements of GMP. This unit applies to those with formal responsibility for others and to those required to model workplace policies and procedures but who have no formal management role.

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Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Ensure others in the work area are able to meet GMP requirements	1.1 Relevant clothing and equipment appropriate to work requirements are available, functional and correctly fitted 1.2 Advice on GMP responsibilities and procedures is accessible and clearly explained 1.3 GMP control measures used in the work area can be identified by those in the work area 1.4 Mentoring and coaching support is available to support individuals/groups to implement GMP and related procedures 1.5 Training needs are identified and addressed within level of responsibility
2 Monitor personal hygiene and conduct of team members in the work area	2.1 Personal hygiene of work team meets GMP requirements 2.2 Clothing is prepared, used, stored and disposed of according to GMP and workplace procedures 2.3 Personal movement around the workplace complies with area entry and exit procedures
3 Monitor implementation of GMP requirements in the work area	3.1 GMP procedures in the work area are clearly defined, documented and followed 3.2 Non-compliance with identified procedures is reported and addressed within level of responsibility 3.3 Personal behaviour is consistent with workplace policies and procedures that support GMP 3.4 Workplace procedures to control resource allocation and process are followed to meet GMP requirements 3.5 GMP non-conformance is identified and reported according to workplace procedure 3.6 GMP information is recorded to meet

- workplacereporting requirements
- 3.7 The workplace is maintained in a clean and tidy order to meet GMP housekeeping standards
- 4 Contribute to validation processes
 - 4.1 Validation practices and procedures are reviewed in consultation with relevant personnel
 - 4.2 Validation results and issues are identified and corrective action taken within level of responsibility
 - 4.3 Documentation and recording requirements meet GMP code and company requirements
- 5 Take corrective action in response to GMP non-compliance
 - 5.1 Processes, practices or conditions which could result in non-compliance with GMP are identified and reported according to workplace reporting requirements
 - 5.2 Corrective action is taken in accordance with level of responsibility
 - 5.3 GMP issues are raised with designated personnel
- 6 Maintain and improve GMP in the work area
 - 6.1 Processes or conditions which could result in non-conformance with GMP are identified, reported and corrected within level of responsibility
 - 6.2 Matters raised relating to GMP are promptly resolved and/or referred to appropriate personnel
 - 6.3 Effectiveness of control measures are monitored within level of responsibility
 - 6.4 Others in the work area are advised of GMP matters relevant to work role
 - 6.5 Changes to documentation are proposed in accordance with workplace procedures to maintain GMP
 - 6.6 GMP audits are conducted to meet company and legislative requirements
 - 6.7 Action is taken to respond to audit recommendations within level of responsibility

Required Skills and Knowledge

Not applicable.

Evidence Guide

The assessment process must address all of the following items of evidence.

Ability to:

1. Communicate information about GMP requirements and related procedures to others in the work area. This requires demonstration of two-way communication including active listening and constructive response to feedback
2. Provide access to GMP documentation
3. Model personal conduct and work activities to meet requirements of GMP
4. Identify control points in work area and demonstrate monitoring techniques used
5. Support others to identify control points and demonstrate monitoring and control methods
6. Support others to follow GMP procedures. This includes validation procedures within level of responsibility
7. Ensure that appropriate and timely action is taken in response to non-compliance
8. Determine action required to respond to GMP non-compliance within level of responsibility
9. Participate in consultation processes to improve GMP. This may include investigating actual and potential GMP non-compliance
10. Participate in and/or review practices and procedures to prevent or minimise the likelihood of unacceptable performance
11. Ensure that housekeeping standards are maintained and that equipment is in operational order. This may include participating in the management of equipment calibration
12. Monitor the recording of GMP information to confirm that records accurately reflect performance and meet the requirements of the workplace and legislation

Knowledge of:

13. The role of GMP in preventing contamination, its relationship to legislative responsibilities and potential implications of non-compliance
14. GMP arrangements in the workplace. This includes awareness of relevant GMP codes of practice and related workplace policies and procedures to implement these responsibilities
15. The relationship between GMP and the quality system, personnel responsible for designing and managing GMP, personal role to maintain GMP, the role of internal and external auditors as appropriate

16. Procedures followed to investigate contamination events and performance improvement processes
17. Clothing and footwear requirements for working in and/or moving between work areas
18. Current technical and process knowledge required to monitor GMP and participate in investigating GMP non-compliance within level of responsibility. This includes an understanding of common micro-biological, physical and chemical contaminants, conditions under which types of contamination are likely to occur, related control methods and validation procedures and responsibilities
19. Basic concepts of quality assurance including quality specifications, operating parameters, validation procedures and control methods. This includes an understanding of related documentation including Standard Operating Procedures and/or batch instructions
20. Control methods and procedures used in the work area to maintain GMP. This includes an understanding of the purpose of control, the consequence if not controlled and the method of control where relevant. It also includes an understanding of the methods used to monitor process control.
21. Purpose and requirements of validation procedures and purpose of equipment calibration
22. Recall and traceability procedures relevant to work area
23. GMP responsibilities and requirements relating to the work area
24. Properties, handling and storage requirements of raw materials, packaging components and final product handled and used in the work area
25. Standards for materials, equipment and utensils used in the work area
26. Procedures for responding to out-of-specification or unacceptable performance/outcomes. This includes procedures for identifying and isolating or quarantining materials or product of unacceptable quality
27. Documentation system and procedures. This includes record keeping to meet both company and legal requirements, procedures for developing and/or reviewing workplace procedures and document control systems used in the workplace
28. Auditing arrangements, roles and responsibilities as they relate to own work responsibilities. This may include an understanding of the purpose and process for internal and external audit processes
29. Appropriate communication skills and techniques to convey information appropriate to audience
30. Housekeeping requirements and responsibilities relating to own work. Where relevant this includes use and storage of housekeeping/cleaning equipment
31. Waste collection, recycling, handling and disposal. This may include handling/disposal requirements for different types of waste such as hazardous waste where relevant

The assessment process must address all of the following items of evidence.

Ability to:

1. Communicate information about GMP requirements and related procedures to others in the work area. This requires demonstration of two-way communication including active listening and constructive response to feedback
2. Provide access to GMP documentation
3. Model personal conduct and work activities to meet requirements of GMP
4. Identify control points in work area and demonstrate monitoring techniques used
5. Support others to identify control points and demonstrate monitoring and control methods
6. Support others to follow GMP procedures. This includes validation procedures within level of responsibility
7. Ensure that appropriate and timely action is taken in response to non-compliance
8. Determine action required to respond to GMP non-compliance within level of responsibility
9. Participate in consultation processes to improve GMP. This may include investigating actual and potential GMP non-compliance
10. Participate in and/or review practices and procedures to prevent or minimise the likelihood of unacceptable performance
11. Ensure that housekeeping standards are maintained and that equipment is in operational order. This may include participating in the management of equipment calibration
12. Monitor the recording of GMP information to confirm that records accurately reflect performance and meet the requirements of the workplace and legislation

Knowledge of:

13. The role of GMP in preventing contamination, its relationship to legislative responsibilities and potential implications of non-compliance
14. GMP arrangements in the workplace. This includes awareness of relevant GMP codes of practice and related workplace policies and procedures to implement these responsibilities
15. The relationship between GMP and the quality system, personnel responsible for designing and managing GMP, personal role to maintain GMP, the role of internal and external auditors as appropriate
16. Procedures followed to investigate contamination events and performance improvement processes
17. Clothing and footwear requirements for working in and/or moving between work areas
18. Current technical and process knowledge required to monitor GMP and participate in investigating GMP non-compliance within level of responsibility. This includes an understanding of common micro-biological, physical and chemical contaminants, conditions under which types of contamination are likely to occur, related control methods and validation procedures and responsibilities
19. Basic concepts of quality assurance including quality specifications, operating parameters, validation procedures and control methods. This includes an understanding of related documentation including Standard Operating Procedures and/or batch instructions

20. Control methods and procedures used in the work area to maintain GMP. This includes an understanding of the purpose of control, the consequence if not controlled and the method of control where relevant. It also includes an understanding of the methods used to monitor process control.

21. Purpose and requirements of validation procedures and purpose of equipment calibration

22. Recall and traceability procedures relevant to work area

23. GMP responsibilities and requirements relating to the work area

24. Properties, handling and storage requirements of raw materials, packaging components and final product handled and used in the work area

25. Standards for materials, equipment and utensils used in the work area

26. Procedures for responding to out-of-specification or unacceptable performance/outcomes. This includes procedures for identifying and isolating or quarantining materials or product of unacceptable quality

27. Documentation system and procedures. This includes record keeping to meet both company and legal requirements, procedures for developing and/or reviewing workplace procedures and document control systems used in the workplace

28. Auditing arrangements, roles and responsibilities as they relate to own work responsibilities. This may include an understanding of the purpose and process for internal and external audit processes

29. Appropriate communication skills and techniques to convey information appropriate to audience

30. Housekeeping requirements and responsibilities relating to own work. Where relevant this includes use and storage of housekeeping/cleaning equipment

31. Waste collection, recycling, handling and disposal. This may include handling/disposal requirements for different types of waste such as hazardous waste where relevant

Range Statement

The range statement indicates the context for demonstrating competence. This statement is a guide and unless otherwise indicated, items may or may not apply as required by the work context.

- Work is carried out according to company policies and procedures, regulatory and licensing requirements, legislative requirements and industrial awards and agreements

- Legislative requirements are typically reflected in procedures and specifications. Legislation relevant to this industry includes relevant Good Manufacturing Practice (GMP) codes, the Therapeutic Goods Act, labelling, weights and measures legislation and legislation covering environmental management, occupational health and safety, anti-discrimination and equal opportunity

- Responsibility for applying good manufacturing practice relates to the person's work area

- Products/materials handled and stored can include raw materials, packaging components and consumables, part-processed product, finished product and cleaning materials

- Reporting systems may include electronic and manual data recording and storage systems

The range statement indicates the context for demonstrating competence. This statement is a guide and unless otherwise indicated, items may or may not apply as required by the work context.

- Work is carried out according to company policies and procedures, regulatory and licensing requirements, legislative requirements and industrial awards and agreements
- Legislative requirements are typically reflected in procedures and specifications. Legislation relevant to this industry includes relevant Good Manufacturing Practice (GMP) codes, the Therapeutic Goods Act, labelling, weights and measures legislation and legislation covering environmental management, occupational health and safety, anti-discrimination and equal opportunity
- Responsibility for applying good manufacturing practice relates to the person's work area
- Products/materials handled and stored can include raw materials, packaging components and consumables, part-processed product, finished product and cleaning materials
- Reporting systems may include electronic and manual data recording and storage systems

Unit Sector(s)

Not applicable.

MEM05012C Perform routine manual metal arc welding

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers preparing the materials and carrying out routine manual metal arc welding (MMAW).

Application of the Unit

Application of the unit	This unit applies in a maintenance or manufacturing environment where the welding is not required to meet an Australian standard or equivalent. Fillet and butt welds would typically be performed on low carbon/mild steels. Where welding is required to AS 1554 General Purpose or equivalent codes, occupational health and safety regulations and/or licensing requirements, Unit MEM05015D (Weld using manual metal arc welding process) should be selected. Band: A Unit Weight: 2

Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify weld requirements	1.1. Weld requirements are identified from job instructions. 1.2. Location of welds is identified in accordance with standard operating procedures and job specifications.
2. Prepare materials for welding	2.1. Materials are cleaned and prepared ready for welding.
3. Prepare equipment for welding	3.1. Welding equipment is set up correctly. 3.2. Correct electrodes are selected to suit application and settings.
4. Perform routine welding using MMAW	4.1. Safe welding practices are applied. 4.2. Materials are welded to job requirements. 4.3. Welds are cleaned in accordance with standard operating procedures.

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	This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, then appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with performing routine manual metal arc welding or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Materials	Low and mild carbon steel or similar
Prepared	Cleaning, setting up jigs, fixtures, clamps, joint preparation
Welding equipment	Welding leads, welding machines, electrode holder etc.
Cleaned	Slag and spatter, cleaning, using files and grinders

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Fabrication

MEM07033B Operate and monitor basic boiler

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing start-up, take-over/hand-over, monitoring, shut-down and storage of a basic boiler. It includes inspection procedures as specified in manufacturers' recommendations and workplace procedures, and identification of maintenance requirements and hazard control measures.

Application of the Unit

Application of the unit	All work is carried out to applicable State/Territory and National OHS legislation, standards and codes of practice. The boilers covered by this unit would typically have the following features: single fixed combustion air supply, non-modulating single heat source and fixed firing rate. The unit covers boilers used for all purposes, including the generation of steam. Band: A Unit Weight: 6

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Select and use personnel protective equipment	1.1. Personal protective clothing and equipment is selected and used correctly and in accordance with standard workplace procedures.
2. Carry out pre-operational checks	2.1. Pre-operational checks of boiler are undertaken correctly to plant operating procedures. 2.2. Maintenance requirements and visual faults are reported according to standard workplace procedures.
3. Maintain health and safety standards in work area	3.1. Hazards and potential hazards are identified and reported according to standard workplace procedures. 3.2. Hazard prevention/control measures are selected and used as required.
4. Start boiler	4.1. Boiler is started and brought on line safely, consistent with workplace procedures and production

ELEMENT	PERFORMANCE CRITERIA
	requirements.
5. Conduct hand-over/take-over procedures	5.1. Operating status of boiler is confirmed. 5.2. Operating log is maintained and boiler status/operation is communicated according to workplace procedures.
6. Operate and monitor boiler	6.1. Boiler is operated and monitored consistent with production and safety requirements. 6.2. Boiler water quality tests are conducted to manufacturer's recommendations and workplace procedures. 6.3. Boiler water quality is adjusted as required to manufacturer's recommendations and workplace procedures. 6.4. Boiler failures/emergencies are acted on according to workplace procedures and downstream users are notified, if necessary.
7. Carry out boiler operational shut-down	7.1. Boiler is shut down consistent with workplace procedures, production and safety requirements.
8. Carry out boiler shut-down for an internal inspection	8.1. Boiler is shut down for internal inspection according to manufacturer's recommendations and workplace procedures. 8.2. Boiler is cleaned internally and externally to manufacturer's recommendations and workplace procedures.
9. Store boiler in shut-down mode	9.1. Required storage mode is identified. 9.2. Boiler is stored to manufacturer's recommendations and workplace 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:

- selecting and using personal protective clothing and equipment

REQUIRED SKILLS AND KNOWLEDGE

- performing pre-operational checks of boiler
- identifying and reporting maintenance requirements
- identifying and reporting hazards and potential hazards in work area
- responding to boiler failures/emergencies
- applying hazard prevention/control measures
- starting boiler and bringing on line
- confirming operating status of boiler
- maintaining operating log
- communicating boiler status information
- monitoring boiler
- conducting boiler water quality tests
- adjusting boiler water quality
- shutting down boiler
- cleaning boiler internally and externally
- storing boiler

Required knowledge

Look for evidence that confirms knowledge of:

- personal protective clothing and equipment use and applications
- pre-operational checks such as feed water supply, boiler water level, fuel supply/heat source, boiler valves their operation and position, combustion air supply and combustion equipment
- procedures for identifying and reporting maintenance
- statutory requirements and workplace procedures for identifying and reporting hazards in the work area
- hazard prevention and control measures
- processes for starting a boiler, such as heat input, warm up of the reticulation system, steam traps and steam line purge, systems operation, reticulation line pressure, steam usage and supply
- processes for confirming operational status of boiler
- procedures for maintaining operating log
- procedures for communicating boiler status and operation
- principles of boiler operation
- boiler fittings
- preparing boiler for inspection
- procedures for monitoring a boiler, such as steam reticulation line pressure, usage, supply and quality of steam, combustion/heat source system, feed water system, fuel system combustion air supply, water level, boiler steam pressures and operation of control/safety devices etc.
- location of inspection and explosion doors
- procedures for conducting boiler water quality tests

REQUIRED SKILLS AND KNOWLEDGE

- feed water systems and treatment
- emergency procedures such as identification of emergency, isolation of heat source, selection and application of appropriate fire fighting equipment and notification of down stream users etc.
- processes and procedures such as confirming water level, cooling down, boiler pressure/vacuum and fuel/heat source isolation etc. when operationally shutting down a boiler
- processes and procedures such as confirming boiler cooling down, vacuum/pressure, fuel/heat source isolation, removal of combustion equipment and water from boiler, isolation from any common connection and the opening of all access points required for inspection etc.
- procedures for cleaning the boiler internally and externally
- the various modes of boiler storage
- procedures for storing the boiler in open or closed condition

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 and monitor a basic boiler. 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	
	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 operating and monitoring a basic boiler 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.	
Pre-operational checks	Feed water supply, boiler water level, fuel supply/heat source, boiler valves - their operation and position, combustion air supply and combustion equipment
Boiler	Single fixed combustion air supply, non-modulating single heat source and fixed firing

RANGE STATEMENT	
	rate
Hazards	Chemical and thermal hazards, manual handling, guarding of machinery, illumination of work area, rubbish and combustibles, leakage of steam and fuel etc.
Monitored	Steam pressure, flame and combustion conditions, feed system and condensate returns, fuel system, water level, combustion management system, water management system, boiler and steam manifold fittings, soot blowers
Storage mode	Wet and dry storing, open or closed condition

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM07034A Operate and monitor intermediate class boiler

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers performing start-up, take-over/hand-over, monitoring, shut-down and storage of single or multiple intermediate class boilers and associated equipment to legislative requirements, standards and codes of practice.

Application of the Unit

Application of the unit	This unit applies to the start-up, take-over/hand-over and shut-down of intermediate class boilers. Boilers covered by this unit would typically have the following features: modulating combustion air supply, modulating single heat source, modulating firing rate, and or superheaters, economisers, and other associate equipment. The unit applies to boilers used for all purposes including steam generation and other industrial uses as required in the workplace. The boilers may be singular or in a battery of boilers. Work includes inspection procedures as specified in the manufacturer's recommendations and workplace procedures, identification of maintenance requirements and hazard control measures. All work is carried out to applicable State/Territory and National OHS legislation, standards and codes of practice, including relevant aspects of NOHSC 1006 (1995), AS 3873 (Operation and maintenance of steam plant) and AS2593 1995 (Boilers - unattended and limited attendance) Where basic boiler operation (e.g. single fixed combustion air supply, non-modulating single heat source and fixed firing rate) only is required, Unit MEM07033B (Operate and monitor basic boiler) should be selected.

	Band: A Unit Weight: 4

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM07033B	Operate and monitor basic boiler

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Carry out pre-operational	1.1.Pre-operational checks of boiler and associated equipment are carried out according to standard

ELEMENT	PERFORMANCE CRITERIA
checks	operating procedures. 1.2. Maintenance requirements are identified and reported in accordance with standard operating procedures.
2. Maintain health and safety standards in work area	2.1. Hazards and potential hazards in work area are identified and reported in accordance with statutory requirements and workplace procedures. 2.2. Personal protective equipment and clothing is selected and used as appropriate, according to statutory requirements and workplace procedures. 2.3. Hazard prevention/control measures are selected and used as required, in accordance with statutory requirements and workplace procedures
3. Start up boiler	3.1. Boiler is started and brought on line safely, consistent with workplace procedures and production requirements.
4. Conduct hand-over/take-over procedures	4.1. Operating status of the boiler is confirmed in accordance with manufacturer's recommendations and workplace procedures. 4.2. Boiler status and operation is communicated according to workplace procedures and statutory requirements.
5. Operate and monitor intermediate class boiler and associated equipment	5.1. The boiler and associated equipment is operated and monitored consistent with production and safety requirements. 5.2. Boiler water quality tests are conducted to manufacturer's recommendations and workplace procedures. 5.3. Water quality is maintained according to manufacturer's recommendations and workplace procedures. 5.4. Boiler failures and emergencies are responded to in accordance with statutory requirements, manufacturer's recommendations and workplace procedures.
6. Shut down boiler and associated equipment	6.1. Operational shut-downs of boiler and associated equipment are carried out in accordance with work-place procedures, production and safety requirements. 6.2. Shut-downs of boiler and associated equipment for internal inspection are carried out in accordance with workplace procedures, production and safety

ELEMENT	PERFORMANCE CRITERIA
	requirements. 6.3. Boiler is isolated in accordance with statutory requirements, manufacturer's recommendations and workplace procedures. 6.4. Boiler is cleaned internally and externally to manufacturer's recommendations and workplace procedures.
7. Store boiler in shut-down mode	7.1. Appropriate storage mode is identified 7.2. Boiler and associated equipment is stored in shut-down mode to manufacturer's recommendations and workplace 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, standard operating procedures and statutory requirements
- performing preoperational checks of boiler
- performing maintenance checks
- orally reporting routine information
- identifying hazards, hazardous situations and control measures
- using personal protective clothing and equipment
- selecting the most appropriate prevention/control measure for a given situation
- starting up boilers, including those fitted with associated equipment such as superheaters and economisers
- monitoring boilers, including checks of combustion management system and superheater and economiser operation
- checking operating status
- recording routine and familiar information in operating log and other standard workplace forms
- performing water quality tests to manufacturer's recommendations and workplace procedures
- using testing equipment
- adjusting water quality

REQUIRED SKILLS AND KNOWLEDGE

- responding to typical emergency situations
- notifying downstream users
- performing operational and inspection shut-down, including procedures for associated equipment, such as superheaters and economisers
- isolating boiler from any common connection between the boiler and other boilers on line and all access points required for inspection

Required knowledge

Look for evidence that confirms knowledge of:

- pre-operational checks
- procedures for identifying and reporting maintenance requirements
- statutory requirements and workplace procedures for identifying and reporting hazards in the work area
- use and application of personal protective equipment
- safe work practices and procedures
- prevention and control measures
- the processes for starting a boiler such as heat input, warm up of the reticulation system, steam traps and steam line purge, systems operation, reticulation line pressure, steam usage and supply, associated equipment such as superheaters and economisers
- the process for confirming operational status of boiler
- procedures for maintaining an operating log and communicating boiler status
- procedures for communicating boiler status and operation
- principles of intermediate boiler operation - single and battery
- boiler fittings
- preparing boiler for inspection
- feed water systems and treatment, including de-aerator function and purpose
- procedures for monitoring an intermediate class boiler, such as steam reticulation line pressure, usage, supply and quality of steam, combustion/heat source system, feed water system, fuel system, combustion air supply, water level, boiler steam pressures and operation of control/safety devices, combustion management system, associated equipment such as superheaters and economisers
- function, purpose and location of associated equipment:
 - superheater
 - economiser
 - air heater
 - feed water heater
 - attemperator
 - superheater safety valves
 - economiser relief valves
 - main steam stop valve

REQUIRED SKILLS AND KNOWLEDGE

- procedures for conducting boiler water quality tests
- procedures for adjusting boiler water quality
- procedures such as identification of emergency isolation of heat source, operation of boiler, selection and application of fire fighting equipment and notification of downstream users
- operational shut-down processes and procedures such as confirming water level, cooling down, boiler pressure/vacuum and fuel/heat source isolation
- shut-down processes and procedures for internal inspection, such as confirming boiler cooling down, vacuum/pressure, fuel/heat source isolation, removal of combustion equipment and water from boiler
- isolation procedures and safety issues
- procedures for cleaning boiler internally and externally
- various modes of boiler storage, which may include integral associated equipment such as superheaters and economisers
- the reasons for selecting particular storage mode
- procedures for storing a boiler in shut-down mode

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 and monitor intermediate class boilers. 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

EVIDENCE GUIDE	
	workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate. This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with operating and monitoring intermediate class boilers or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Pre-operational checks	Feed water supply, boiler water level, fuel supply/heat source, boiler valves - their operation and position, combustion air supply and combustion equipment

RANGE STATEMENT	
Boiler	Modulating combustion air supply, modulating single heat source, modulating firing rate, and or superheaters, economisers, single and battery
Hazards	Chemical and thermal hazards, manual handling, machine guarding, illumination of work area, rubbish and combustible materials, steam and fuel leaks etc.
Associated equipment	Superheater, superheater safety valves, economiser, economiser relief valves, air heater, feed water heater, attemperator, main steam stop valve
Monitored	Steam pressure, flame and combustion conditions, feed system and condensate returns, fuel system, water level, combustion management system, water management system, boiler and steam manifold fittings, soot blowers
Storage mode	Wet and dry storing, open or closed condition

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Machine and process operations

MEM09002B Interpret technical drawing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers interpreting technical drawing applying to any of the full range of engineering disciplines.

Application of the Unit

Application of the unit	Technical drawings may utilise perspective, exploded views or hidden view techniques. Drawings are provided to Australian Standard 1100 and/or Australian Standard 1102 and their equivalents from the full range of engineering disciplines. Standard symbols to Australian Standard 1100 and/or Australian Standard 1102 or equivalent are recognised in field of employment. Technical drawings may include symbol glossaries. Where any drawing, sketch, chart, diagram is only used as the technique for communication, then this unit does not apply: see Unit MEM12023A (perform engineering measurements) or Unit MEM16006A (Organise and communicate information). Band: A Unit Weight: 4

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Select correct technical drawing	1.1. Drawing is checked and validated against job requirements or equipment. 1.2. Drawing version is checked and validated.
2. Interpret technical drawing	2.1. Components, assemblies or objects are recognised as required. 2.2. Dimensions are identified as appropriate to field of employment. 2.3. Instructions are identified and followed as required. 2.4. Material requirements are identified as required. 2.5. Symbols are recognised in the drawing as appropriate.

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

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

A person who demonstrates competency in this unit must be able to interpret technical drawings as described.

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

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Context of and specific resources for assessment

This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with interpreting technical drawings or other units requiring the exercise of the skills and knowledge covered by this unit.

Method of assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Guidance information for assessment

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Interpret technical drawing

AS1100.101 is an extensive work and the candidate is not required to have complete familiarity with all its contents, the application of AS1100 would usually be in line with standard operating procedures; interpretation may require guidance particularly in respect to any geometric tolerancing

Unit Sector(s)

Unit sector

Co-requisite units

Co-requisite units

Competency field

Competency field	Drawing, drafting and design

MEM09003B Prepare basic engineering drawing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers identifying the drawing requirements, preparing or making changes to engineering drawings, preparing an engineering parts list and issuing the drawings

Application of the Unit

Application of the unit	The unit applies to the fields of mechanical, electrical/electronic, fabrication, and fluid power. Specifications may be obtained from design information, customer requirements, sketches and preliminary layouts. Manual drafting and drawing equipment is used, or where a Computer Aided Design (CAD) system is used other units should also be considered. This unit applies to any of the full range of engineering disciplines. Where a more extensive Computer Aided Drafting System is used for design, then Unit MEM09009C (Create 2D drawings using computer aided design system), should also be considered. Band: A Unit Weight: 8

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify drawing requirements	1.1. Requirements and purpose of drawing are determined from customer and/or work specification and associated documents. 1.2. All data necessary to produce the drawing is identified and collected. 1.3. Drawing requirements are confirmed with relevant personnel and timeframes for completion are established.
2. Prepare or make changes to engineering drawing	2.1. Drafting equipment is selected appropriate to the drawing method chosen. 2.2. Drafting principles are applied to produce a drawing that is consistent with standard operating procedures

ELEMENT	PERFORMANCE CRITERIA
	within the enterprise. 2.3. All work is undertaken safely and to prescribed procedure. 2.4. Completed drawing is approved in accordance with standard operating procedures.
3. Prepare engineering parts list	3.1. Components parts are identified and organised by component type and/or in accordance with organisation/customer requirements.
4. Issue drawing	4.1. Drawings and or parts lists records are completed in accordance with standard operating procedures. 4.2. Approved drawings and or parts lists are copied and issued to relevant personnel in accordance with standard operating procedures. 4.3. Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Look for evidence that confirms skills in:

- obtaining all relevant job requirements, data/information and specifications necessary to produce the drawing in accordance with workplace procedures
- using drafting equipment appropriate to the drawing method chosen
- producing/changing the drawing to conform with the relevant standard
- undertaking all work safely and in accordance with workplace procedures
- checking the completed drawing in accordance with standard operating procedures
- producing the component parts list with part name, description of part, material specification or part number, quantities and all other details specified by the customer and/or organisational procedures
- recording completed drawings and or parts lists in accordance with standard operating procedures
- where appropriate, copying and issuing approved drawings and or parts lists in accordance with standard operating procedures

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

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

A person who demonstrates competency in this unit must be able to prepare basic engineering drawings. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

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

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Context of and specific resources for assessment

This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with preparing basic engineering drawing or other units requiring the exercise of the skills and knowledge covered by this unit.

Method of assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

EVIDENCE GUIDE**Guidance information for assessment****Range Statement****RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Relevant personnel

Technical personnel, supervisors, manufacturers, suppliers, contractors, customers

Drafting equipment

Drafting and drawing equipment includes the use of Computer Aided Drafting systems

Drafting principles

Drawings are prepared in accordance with Australian Standard 1100.101, or equivalent, as required

Interpretation of AS1100.101 or other problems are resolved in consultation with a supervisor

Records

Drawing records may include cataloguing, issuing security classifications, filing, preparing distribution lists

Issued

In hard copy, photographic, slide or transparency form including presentation as a single drawing and/or with other drawings, support documentation as a package

Unit Sector(s)**Unit sector**

Co-requisite units

Co-requisite units		

Competency field

Competency field	Drawing, drafting and design

MEM11011B Undertake manual handling

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers lifting and moving materials manually.

Application of the Unit

Application of the unit	This unit applies to lifting and moving materials manually and/or using basic manual handling equipment in a wide range of environments. Maximum manual lifting weight is limited to National Occupational Health and Safety Commission (NOHSC) recommendations. Band: A Unit Weight: 2

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Lift materials manually	1.1. Material weight is determined correctly utilising most appropriate technique, and risks associated with lifting are assessed. 1.2. Lifting techniques are undertaken to National Occupational Health and Safety Commission (NOHSC) and standard operating procedures. Types of movement, methods, storage, height and position are considered.
2. Move/shift materials manually	2.1. Appropriate equipment is selected where required. 2.2. Material is placed safely and securely on moving equipment. 2.3. Material is relocated ensuring safety of personnel and security of material. 2.4. Material is unloaded from moving equipment and placed in a safe and secure manner.

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:

- identifying relevant standards and lifting techniques
- assessing weight of material
- selecting lifting equipment
- working and communicating in teams
- assessing risks
- planning
- reading and interpreting routine information on written job instructions, specifications and standard operating procedures. May include drawings
- following oral instructions

Required knowledge

Look for evidence that confirms knowledge of:

- manual handling techniques
- hazards of incorrect procedures
- NOHSC standards for manual handling
- 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 move loads manually using appropriate aids.

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.

EVIDENCE GUIDE	
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 moving loads manually 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.

RANGE STATEMENT	
Material weight	Material weight is determined using scales or interpreting signage
Lifting techniques	Individual or team lifting, use of appropriate lifting equipment
Appropriate equipment	Hand trolleys, wheelbarrows, motorised/hand pallet trucks (not sit on), scissor lifts, boom lifts, hand carts, dedicated production or process lifting equipment such as baskets, spreader bars, cradles or the like attached to lifting equipment

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Materials handling

MEM16005A Operate as a team member to conduct manufacturing, engineering or related activities

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers operating as a member of a team, where operations and outcomes are dependent on the performance of the entire team.

Application of the Unit

Application of the unit	This unit applies to a range of team activities that are carried out within a section of a manufacturing, engineering or a related work environment. Activities are interdependent in nature, with each team member providing a critical component of the output. Effective interaction and collaboration between team members is required in order to achieve team goals. Band: A Unit Weight: 2

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify team goals and processes	1.1. Team goals and requirements are identified. 1.2. Processes in place to assist in meeting team goals are identified. 1.3. Workflow and processes are described. 1.4. Roles and responsibilities of team members are identified. 1.5. Relationships within team and with other work areas are identified.
2. Communicate and cooperate with team members	2.1. Effective interpersonal skills are used to interact with team members and to contribute to activities and objectives. 2.2. Formal and informal forms of communication are used effectively to support team achievement. 2.3. Team members are assisted as required to ensure team achieves goals and requirements.

ELEMENT	PERFORMANCE CRITERIA
	2.4.Diversity is respected and valued in team functioning. 2.5.Views and opinions of other team members are understood and reflected accurately. 2.6.Workplace terminology is used correctly to assist communication.
3. Work as a team member	3.1.Tasks are performed in accordance with organisational and team requirements, specifications and workplace procedures. 3.2.Agreed reporting lines are followed using standard operating procedures.
4. Solve problems as a team member	4.1.Potential and real problems faced by team are identified. 4.2.Procedures for avoiding and managing problems are identified. 4.3.Problems are solved effectively and in a manner which supports team functioning.

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:

- contributing to achievement of team goals
- communicating and cooperating with team members
- coordinating work effort with others
- applying effective interpersonal skills
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- solving problems

Required knowledge

Look for evidence that confirms knowledge of:

- effective interpersonal strategies and skills:

REQUIRED SKILLS AND KNOWLEDGE

- effective listening
- basic speaking skills
- use of terminology and jargon
- giving and receiving feedback
- checking and clarifying task-related information
- interpreting instructions
- basic conflict resolution
- selecting modes and methods of communication
- identifying and resolving communication breakdowns and barriers
- principles of effective communication
- relationships and roles within team and with others
- reporting relationships and procedures
- own responsibilities with respect to products/services to be provided by team
- skills and competencies of the individual and other employees performing interdependent activities
- team goals, objectives and task requirements
- sources of technical expertise/assistance
- appropriate forms of communication
- hazards and control measures associated with team activities, 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 operate in a work-based team environment.

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.

EVIDENCE GUIDE	
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 operating in a work-based team environment or other units requiring the exercise of the skills and knowledge covered by this unit.
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and

RANGE STATEMENT	
regional contexts) may also be included.	
Team goals	Production or manufacturing output, deadlines and timelines, resource use, performance, mistake elimination targets, process improvements, maintenance activity, safety levels
Effective interpersonal skills	Basic listening and speaking skills, use of terminology and jargon, giving and receiving feedback, interpreting instructions, verbal and non-verbal modes and methods of communication, communication breakdowns and barriers, basic principles of effective communication
Formal and informal forms of communication	Meetings, documentation, updates, handover, signage, discussion, explanations, demonstration, electronic
Diversity	Ethnicity, age, gender, demographics, disability
Workplace terminology	Terminology - referring to equipment, processes, workplace areas, staff and procedures - specific to the processes and equipment used in the workplace

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Communication

MEM18011C Shut down and isolate machines/equipment

Modification History

Single band identifier removed to clarify dual status.

Unit Descriptor

Unit descriptor	This unit covers isolating and shutting down machines and equipment.

Application of the Unit

Application of the unit	This unit applies to situations that require extensive system knowledge that exclude the straightforward starting/stopping of machinery/equipment through the use of simple switching, including use of emergency switches. Shut-down/isolation is undertaken autonomously or as part of teamwork. Band: This unit has dual status and is to be regarded as both a specialisation band A unit and Specialisation band B unit for progression to C7 (AQF level IV). Unit Weight: 2

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Shut down machine/equipment	1.1. Machine/equipment operational function is determined and understood. 1.2. Shut-down sequence is undertaken safely and to standard operating procedures. 1.3. Machine/equipment is depressurised/emptied/de-energised/bled to standard operating procedures. 1.4. Safe shut-down of machine/equipment is verified. 1.5. Safety/security lock-off devices and signage are installed to standard operating procedures. 1.6. Machine/equipment is left in clean and safe state.
2. Isolate machine/equipment	2.1. Machine/equipment operational function is determined and understood. 2.2. Isolation methods and points are recognised and identified.

ELEMENT	PERFORMANCE CRITERIA
	2.3. Isolation is undertaken safely and to standard operating procedures. 2.4. Safe isolation of machine/equipment is verified. 2.5. Safety/security lock-off devices and signage are installed to standard operating procedure. 2.6. Machine/equipment is left in clean and safe state.

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 and other applicable reference documents
- checking and clarifying task-related information
- entering information onto proformas and standard workplace forms
- shutting down machine/equipment
- purging/de-energising equipment
- installing safety/security lock-off devices and signage\

Required knowledge

Look for evidence that confirms knowledge of:

- the operational function of the machine/equipment
- the shut-down sequence
- the procedures for shutting down and isolating the machine/equipment
- safety precautions for shutting down and isolating the machine/equipment
- procedures for purging/de-energising the machine/equipment and reasons for doing so
- procedures for verifying machine/equipment shut-down and isolation and reasons for verifying
- the safety/security lock-off devices and signage to be installed
- the reasons and procedures for installing lock-off devices and signage
- the reasons for ensuring the machine/equipment is left in a clean, safe state
- hazards and control measures
- use and application of personal protective equipment

REQUIRED SKILLS AND KNOWLEDGE

- safe work practices and procedures

Evidence Guide**EVIDENCE GUIDE**

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

A person who demonstrates competency in this unit must be able to shut down and isolate machines/equipment.

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 shutting down and isolating machines/equipment 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**

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.

Shut down/isolate	Shut down/isolation means and includes isolation of mechanical, electrical drives, pipework (pressure) rotating equipment etc. utilising electrical lock-off isolators, mechanical and power driven valves etc. in accordance with standard operating instructions. Relevant regulations, Australian standards and legislative requirements governing isolation and shut-down must be complied with
Machine/equipment	Manual, semi automatic and automatic machines of a stand-alone, continuous production or process nature.

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics

MSACMT671A Develop and manage sustainable environmental practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed to identify opportunities for and make improvements in sustainable environmental practices in production, maintenance and logistics. Areas covered include efficient use of raw materials, management of waste, electricity conservation, heat conservation and management, water management, environment protection and environment obligations of enterprises.

Application of the Unit

Application of the unit	This is the highest level sustainable environmental practices unit in the CM. In a typical scenario, there is a need to reduce waste in the value chain. Part of this is the cost of environmental resources to the process. Some of this is necessary waste but a large part of environmental resource use may be unnecessary waste and so should be totally eliminated. In order to make these savings, there is a need to analyse environmental resource use and cost in all its forms and then develop and implement plans for the more efficient use of energy. This unit primarily requires the application of communication and problem solving skills associated with collecting and analysing information. An ability to analyse resource use of technology or processes will be applied. Initiative and enterprise, and planning and organising are also required to develop plans for efficient resource use. This unit also requires aspects of self management and learning to ensure feedback and new learning is integrated into the development of

	processes.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance Criteria describe the performance needed to demonstrate achievement of the Element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Analyse resource use	1.1. Identify all resource consuming processes 1.2. Determine quantity and nature of resource consumed 1.3. Analyse resource flow through different parts of the process
2. Develop resource conservation plans	2.1. Determine the efficiency of use/conversion of resources 2.2. Determine causes of low efficiency of use

ELEMENT	PERFORMANCE CRITERIA
	2.3. Develop plans for increasing the efficiency of resource use 2.4. Check resource use plans comply with regulations/licensing requirements 2.5. Determine benefit/cost of plans
3. Investigate alternative sources of resource	3.1. Determine the function of the resource used 3.2. Develop a specification for function 3.3. Identify a range of sources for meeting that function 3.4. Determine benefit/cost for alternative resource sources
4. Develop plans for more efficient resource use	4.1. Compare benefit/costs for different alternatives developed 4.2. Rank proposals based on benefit/cost compare to limited resources 4.3. Check proposals meet regulatory requirements 4.4. Recommend proposals for improving resource efficiency
5. Implement selected plans	5.1. Liaise with relevant people to implement resource efficiency plans 5.2. Follow through to ensure implementation occurs 5.3. Monitor implementation and make adjustments as required 5.4. Check new resource usage to ensure improvements have occurred

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- analysis
- mathematics
- communication
- problem solving
- data gathering.

REQUIRED SKILLS AND KNOWLEDGE
planning and organising
Required knowledge
- the '3Rs' - reduce, re-use, recycle - regulatory/licensing requirements - types and sources of resources - methods of analysing resource efficiency for different resources - alternative resources/alternative ways of achieving the same function - principles of resource efficiency - relevant regulatory/legislative requirements - process needs for resources

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, the range statement and the assessment guidelines for this training package.	
Overview of assessment requirements	The person will be able to analyse the resource use of any/all part/s of the process and determine if there are more efficient/cheaper ways of achieving the same result.
What are the specific resource requirements for this unit?	Access to an organisation seeking to improve its resource usage.
In what context should assessment occur?	Assessment needs to be conducted in an organisation where resource use is a significant cost component.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit is related to: <i>MSACMT271A Use sustainable environmental practices</i> - which covers the individual application level, and <i>MSACMT670A Develop and manage sustainable energy practices</i> - which covers energy specific aspects.
What method of assessment should apply?	Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria, skills and knowledge. A holistic approach should be taken to the assessment. Assessors should gather sufficient, fair, valid, reliable,

EVIDENCE GUIDE	
	authentic and current evidence from a range of sources. Sources of evidence may include direct observation, reports from supervisors, peers and colleagues, project work, samples, organisation records and questioning. Assessment should not require language, literacy or numeracy skills beyond those required for the unit. The assessee will have access to all techniques, procedures, information, resources and aids which would normally be available in the workplace. The method of assessment should be discussed and agreed with the assessee prior to the commencement of the assessment.
What evidence is required for demonstration of consistent performance?	If evidence is from a major project to improve resource efficiency, then it may provide sufficient evidence. If evidence is from a number of minor improvements to resource use then a range of such improvements will be needed to provide sufficient evidence.

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.	
Resources	Resources includes all raw materials and components as well as cooling water, process water, cleaning water, fuels, lubricants and other materials used in/required by the process.
Waste	Waste (also known as muda in the Toyota Production System and its derivatives) is any activity which does not contribute to customer benefit/features in the product. Within manufacturing, categories of waste include: • excess production and early production • delays

RANGE STATEMENT	
	• movement and transport • poor process design • inventory • inefficient performance of a process • making defective items. Waste for this unit may include activities which do not yield any benefit to the organisation or any benefit to the organisations customers.
Necessary waste	Necessary waste is any activity or cost which does not contribute directly to customer benefit/feature in the product, and which cannot be avoided (e.g. regulatory compliance and fixed costs). Necessary waste cannot be eliminated but should be managed.
Unnecessary waste	Unnecessary waste is any activity or cost which does not contribute directly to customer benefit/features in the product and can be avoided. Unnecessary waste should be eliminated as quickly as practical.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSAENV272B Participate in environmentally sustainable work practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	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. This unit is based on the sustainability guideline standard GCSSUS01A Participate in environmentally sustainable work practices.

Application of the Unit

Application of the unit	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. It includes: • Resources used • Potential environmental hazards • Improving environmental performance (within scope of competency and authority). 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.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has no prerequisites	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify 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 procedures to ensure compliance . 2.2. Report environmental incidents to appropriate personnel.
3. Seek opportunities to improve environmental practices and resource efficiency.	3.1. Follow enterprise plans to improve environmental practices and resource efficiency. 3.2. Make suggestions 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

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 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.

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 and measure resources used in their job
- identify situations likely to lead to an environmental incident
- follow procedures related to environmental performance.

Consistent performance should be demonstrated. For example, look to see that:

- work is routinely to procedures
- the minimum of resources is used consistent with the job requirements, good practice and the procedures.

Context of and specific resources for 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.

Depending on the selected methods of assessment access may be required to:

- workplace procedures and plans
- documentation in relation to production, waste, overheads, hazard control/management
- reports from supervisors/managers
- case study/scenarios

Method of assessment

A holistic approach should be taken to the assessment. Competence in this unit may be assessed:

- by demonstration in the workplace

EVIDENCE GUIDE	
	• 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. 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.
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	
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 including all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.
Environmental and resource efficiency issues	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: • minimisation of waste, through implementation of the waste management hierarchy

RANGE STATEMENT	
	• 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	Measure should be interpreted in a manner consistent with the scope of the job and may include things like: • 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	Appropriate techniques include: • 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	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.
Incidents	Incidents include: • breaches or potential breaches of regulations • occurrences outside of standard procedure which may lead to lower environmental performance.
Enterprise plans	Enterprise plans include:

RANGE STATEMENT	
	• documented policies and procedures • work plans to minimise waste, increase efficiency of water/energy use, minimise environmental hazards
Suggestions	Suggestions include ideas that help to: • 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	

Competency field

Competency field	Competitive manufacturing tools

Co-requisite units

Co-requisite units		

MSAENV472B Implement and monitor environmentally sustainable work practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	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. This unit is based on the sustainability guideline standard GCSSUS02A Implement and monitor environmentally sustainable work practices.

Application of the Unit

Application of the unit	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. It includes: • Identifying areas for improvement • Developing plans to make improvements • Implementing and monitoring improvements in environmental performance. 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.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has no prerequisites	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. 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 techniques/tools 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	
	• monitor and investigate current resource usage • develop plans to improve sustainability • implement environmental improvements. Consistent performance should be demonstrated. For example, look to see that: • 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	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. 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.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed: • 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. 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

EVIDENCE GUIDE	
	similar assessment.
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	
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.
Environmental and resource efficiency issues	Environmental and resource efficiency issues include: - addressing environmental and resource sustainability initiatives such as Environmental Management Systems, action plans, surveys and audits - reference to standards, guidelines and approaches such as: - ISO 14001 Environmental Management Systems - Life Cycle Analyses

RANGE STATEMENT	
	• 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	Measuring techniques include: • 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	Techniques and tools may includeÂ : • visual workplace concepts • measurement, display and/or recording devices • changed work practices/procedures • competence development and awareness training • process and equipment items
Compliance	Compliance includes meeting relevant federal, state and local government laws, by-laws, regulations and codes of practice.
Incidents	Incidents include:

RANGE STATEMENT	
	• breaches or potential breaches of regulations • occurrences outside of standard procedure which may lead to lower environmental performance
Purchasing strategies	Purchasing strategies include: • influencing suppliers to take up environmental sustainability • selecting materials/components with a lower environmental profile.
Stakeholders, key personnel and specialists	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: • 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	Suggestions includes ideas that help to: • 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	

Competency field

Competency field	Competitive manufacturing tools

Co-requisite units

Co-requisite units		

MSAENV672B Develop workplace policy and procedures for environmental sustainability

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the outcomes required to develop and implement a workplace sustainability policy, including the modification of the policy to suit changed circumstances. This unit is based on the sustainability guideline standard GCSSUS03A Develop workplace policy and procedures for sustainability.

Application of the Unit

Application of the unit	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. It includes: • Communicating with relevant stakeholders • Developing and monitoring sustainability policies • Reviewing and improving sustainability policies. 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. This unit will need to be appropriately contextualised as it is applied across an organisation and across different industry sectors.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has no prerequisites	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. 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 strategies 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 procedures 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	
	example, look to see that: • policy implementation is reviewed • policy is developed to become part of the routine practices of the organisation.
Context of and specific resources for assessment	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. 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.
Method of 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. A holistic approach should be taken to the assessment. Competence in this unit may be assessed: • 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. 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.
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

EVIDENCE GUIDE

	appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

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	
	• Cradle to grave/cradle to cradle • Global Reporting Initiative • Ecological Footprint Assessment • Triple Bottom Line reporting • Product Stewardship.
Stakeholders	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: • employees at all levels of the organisation • customers • suppliers • regulators • other organisations.
Strategies	Implementation strategies include: • awareness raising among stakeholders • training of staff in principles and techniques of sustainability • promotional activities. Continuous improvement strategies include ongoing measuring, improving and monitoring such as: • Plan, do, check, act cycles • Kaizen (continuous improvement) • Kaizen blitz (breakthrough improvement event) • Six sigma approaches Environmental sustainability strategies include: • 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 • product and process improvements • carbon offsets • reducing greenhouse gas and other emissions

Unit Sector(s)

Unit sector	

Competency field

Competency field	Competitive manufacturing tools

Co-requisite units

Co-requisite units		

MSAPMOHS100A Follow OHS procedures

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

On completion of this unit, the worker will be able to recognise hazards commonly occurring at the workplace and follow health and safety instructions and procedures in the workplace.

Application of the Unit

Application of this unit

This competency applies to workers who are required to follow OHS instructions and procedures relating to the work being undertaken. Workers will be aware of the importance of maintaining their own health and safety and the health and safety of others in the workplace. Individual workers will also be capable of dealing with incidents and emergencies within their own scope of responsibility and under the direction of the supervisor.

While the instructions and procedures must be derived from the relevant organisation OHS policies, the worker is not required to understand or interpret these policies. This interpretation should be undertaken by the supervisor when informing workers of the OHS requirements.

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. Recognise hazards.	1.1 Identify hazards commonly found in the workplace. 1.2 Check work area routinely before and during work. 1.3 Describe causes of identified hazards.
2. Follow procedures for hazard control.	2.1 Follow procedures to remove or minimise hazards, within the scope of responsibilities and competencies. 2.2 Use required personal protective and other safety equipment. 2.3 Describe the potential consequences of failing to follow these procedures and instructions.
3. Follow emergency procedures.	3.1 Recognise emergency/emergency alarm. 3.2 Go to muster point following procedure. 3.3 Follow instructions related to the emergency.
4. Report problems.	4.1 Report to appropriate people in accordance with workplace procedures when hazards arise.

Required Skills and Knowledge

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

Knowledge and understanding is required of the workplace occupational health and safety (OHS) system sufficient to recognise situations affecting OHS and to take the appropriate action to rectify the situation.

Awareness is required that OHS issues are regulated by State/Territory Acts, regulations, codes of practice and industry standards.

Employees need to be able to follow OHS procedures.

Competence includes the ability to apply and describe procedures for:

- recognising hazards in the workplace
- recognising safety signs and symbols
- recognising hazards commonly found in the workplace and standard controls
- reporting hazards identified to the designated person/according to procedure.

Competence also includes the ability to:

- describe the rights and responsibilities of employees under the OHS legislation
- use and maintain appropriate PPE where required
- communicate OHS issues
- locate and follow OHS procedures under direct supervision.

Language, literacy and numeracy requirements

This unit requires the ability to recognise and interpret safety signs and other basic safety information. It also requires the ability to report hazards in an appropriate way and to follow emergency instructions.

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

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations that will include disruptions to normal, smooth operation.

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:

- describe the workplace OHS system and know the importance of critical procedures
- recognise potential situations requiring action
- implement appropriate corrective action.

Emphasis should be on the ability to avoid a critical incident rather than on recovery from a disaster.

Consistent performance should be demonstrated. For example, look to see that:

- hazards and application of appropriate risk controls are known
- other hazards in the workplace that may arise are known and reporting/taking actions are according to procedure.

Assessment method and context

Assessment for this unit of competency will be on a manufacturing site or in a manufacturing environment.

Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual work environment and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit requires a body of knowledge which will be assessed through questioning and the use of 'what if' scenarios both in the work environment (during demonstration of normal operations and walk throughs of abnormal operations) and off the job.

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

Assessment will require access to a manufacturing plant or working environment over an extended period of time, or a suitable method of gathering evidence of knowledge and understanding over a range of situations. A bank of scenarios, case studies, and 'what ifs' will be required, as will a bank of questions which will be used to check the reasoning behind the 'observable actions.'

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit 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 unit of competency describes OHS requirements applicable for all workers whose work involves the use of workplace policies and procedures to maintain a safe work environment for themselves and others.

It is expected that this competency may be applicable in combination with other industry, occupation or workplace-specific competencies. In all cases it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

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.

Hazards and hazard causes

Known hazards, such as those identified in procedures or training, are recognised. The underlying causes of these identified hazards are also described, eg *the identified hazard is slipping, the cause is spilled granules*.

Tools and equipment

This competency includes use of and checks on equipment and tools such as:

- housekeeping checks, such as obstructions on the floor which may create slip/trip hazard
- guards in place
- equipment in safe condition
- work area clear and organised
- nothing unusual/different
- emergency equipment available
- PPE is functional.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours
- fire and explosion.

Problems

Reporting problems means 'apply procedures to recognise and report hazards'.

Typical problems may include:

- recognition of hazards
- problems encountered in controlling risks associated with hazards
- observation of an injury and/or incident which occurred in the workplace
- clarification of understanding of OHS policies and procedures.

Personnel

Appropriate personnel for OHS referrals may include:

- employer
- supervisor
- employees elected as OHS representatives
- other personnel with OHS responsibilities.
-

Unit Sector(s)

Not applicable.

MSAPMOHS110A Follow emergency response procedures

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit relates to the appropriate response to emergency situations for any new workers at the workplace, possibly delivered as part of an induction program.

Application of the Unit

Application of this unit

This competency applies to operators who are required to know the signals when an emergency situation takes place as well as the proper procedures to follow in order to save oneself from possible injury and/or death.

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. Know when emergency happens.	1.1 Locate emergency signals and controls on machines and/or at the worksite. 1.2 Interpret the signals to take appropriate action. 1.3 Identify emergency where there is no mechanical/ electronic signal.
2. Follow emergency procedures.	2.1 Report emergency according to procedures. 2.2 Identify emergency leader. 2.3 Follow workplace procedures and work instructions for dealing with a range of emergencies, under direct supervision of emergency leader. 2.4 Describe the potential consequences of failing to follow these procedures and instructions. 2.5 Describe what to do if the emergency leader cannot be located when emergency occurs.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit.
Knowledge and understanding of the emergency response procedures sufficient to recognise emergency situations and then determine the appropriate action.

Knowledge of the relevant OHS and environmental requirements, and organisation standard operating procedures, is required along with an ability to implement them in a manner that is relevant to emergency response practices.

Competence includes the ability to:

- identify location of emergency signals on machines and/or at the worksite
- identify emergency situations in which there is no mechanical/electronic signal
- report identified emergency signals/situations to the designated person
- identify the emergency leader
- follow emergency procedures.

Evidence of knowledge of all relevant workplace procedures will include:

- emergency, fire and accident procedures
- chemical spill procedures
- procedures for the use of personal protective clothing and equipment
- organisation standard operating procedures (SOPs)
- hazard policies and procedures
- safety procedures
- personal protective clothing relevant to the required response to the emergency situation.

Language, literacy and numeracy requirements

This unit requires the ability to recognise and respond to emergency signals or other communication of an emergency.

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

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Assessment will occur over a range of situations that will include disruptions to normal, smooth operation.

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:

- recognise potential emergency situations
- take the appropriate action.

Emphasis should be on the ability to follow proper procedures in order to save oneself from possible injury and/or death.

Consistent performance should be demonstrated. For example, look to see that:

- emergency situations are recognised and communicated promptly
- emergency procedures are understood and followed.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems that may have been generated from the past incident history of the workplace and incidents on similar operations around the world.

Assessment method and context

Assessment for this unit will be on a processing plant or in a manufacturing environment.

Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual work environment and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. Emergency drills are a common and appropriate simulation.

This unit of competency requires a body of knowledge which will be assessed through questioning and the use of 'what if' scenarios both in the workplace (during demonstration of normal operations and walk throughs of abnormal operations) and off the job.

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.

It is expected that this competency may be applicable in combination with other industry, occupation or workplace-specific competencies. In all cases it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Specific resources for assessment

Assessment will require access to an operating plant or work environment over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios, case studies and 'what ifs' will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

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 unit of competency describes emergency situation requirements applicable to all workers. It involves the use of workplace policies and procedures to maintain a safe work environment for oneself and others.

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

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 PPE required for emergency response.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours
- fire and explosion.

Personnel

Appropriate personnel for reporting of emergency may include:

- employer
- supervisor
- employees elected as emergency team leader
- other personnel with emergency team leader responsibilities.

Emergency issues

Emergency issues that may need to be raised by workers with designated personnel/ responded to may include:

- observation of injury or incident in the workplace
- fires
- chemical or oil spills
- gas leak or vapour emission
- utilities failure

- bomb scares
- failure or malfunction of plant/machinery.

Emergency signals

Emergency signals include:

- visual - flashing lights
- auditory - alarms.
-

Unit Sector(s)

Not applicable.

MSAPMOHS200A Work safely

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

On completion of this unit, the worker will be able to identify Occupational Health and Safety (OHS) hazards, and assess risk, as well as follow instructions and procedures in the workplace with minimal supervision. The worker will also be capable of participating in and contributing to OHS management issues.

Application of the Unit

Application of this unit

This competency applies to all workers as they carry out their normal day to day activities in a safe manner in compliance with legislative requirements and their duty of care.

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 hazards and assess risk.	1.1 Identify hazards in the work area before and during work. 1.2 Assess risks for the identified hazards. 1.3 Identify controls for these hazards from procedures. 1.4 Review effectiveness of controls within the scope of authority. 1.5 Identify and report remaining risk.
2. Follow procedures for risk control.	2.1 Control risks when working under minimal supervision by following workplace procedures. 2.2 Select, use and maintain relevant personal protective equipment (PPE). 2.3 Handle and store hazardous materials safely.
3. Follow emergency procedures	3.1 Recognise emergency situations. 3.2 Take appropriate initial emergency action. 3.3 Follow procedures for dealing with a range of emergencies.

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.
4. Initiate suggestions to	4.1 Raise OHS issues with designated personnel in

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.
enhance task/job-specific safety.	accordance with workplace procedures and relevant requirements of OHS legislation. 4.2 Contribute to participative arrangements for OHS management in the workplace within organisation procedures and the scope of responsibilities and competencies. 4.3 Provide input to minimise hazards in work area in line with organisation OHS procedures. 4.4 Provide input to opportunities for development of work group's competencies in relation to OHS. 4.5 Support the implementation of procedures to control risks using the hierarchy of control and in accordance with organisation procedures. 4.6 Report to appropriate people in accordance with workplace procedures when non-routine hazards arise.
5. Apply knowledge of OHS legislation and the organisation OHS policies and procedures	5.1 Follow workplace procedures to achieve a safe working environment in accordance with all relevant OHS legislation, including codes of practice relating to particular hazards within the workplace or industry. 5.2 Identify the rights and responsibilities of employees and employers under the relevant OHS legislation. 5.3 Complete (personally or with assistance) hazard, accident or incident reports as required by workplace procedures and relevant sections of OHS legislation.

Required Skills and Knowledge

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

Knowledge and understanding is required of the workplace OHS system and relevant industry standards, sufficient to participate in OHS activities and within the scope of work responsibilities and competencies.

Competence includes the ability to apply and describe:

- the identification of hazards and hazardous areas

- methods for assessing risk
- the identification of standard controls for the hazards
- a simple evaluation of the effectiveness of the controls
- an awareness of the need for further action
- the rights and responsibilities of employees under the OHS legislation
- management systems and procedures for OHS
- the hierarchy of control
- hazard policies, procedures and information
- safety procedures
- emergency, fire and accident procedures
- emergency procedures for handling hazardous materials
- consequences of inappropriate handling of hazardous materials.

Competence also requires the ability to:

- locate, understand and follow workplace OHS procedures
- identify and interpret signs and symbols, including emergency alarms
- recognise hazards common to the industry and in their own workplace
- locate sources of OHS information within the workplace
- select and use personal protective clothing and equipment
- correctly use equipment for handling of chemicals/materials
- interpret and apply relevant Material Safety Data Sheets (MSDS).

Language, literacy and numeracy requirements

This unit requires the ability to read and apply hazard information in the workplace and make suggestions to enhance safety.

Writing is required to the level of completing required safety/incident reports.

Numeracy is required to complete incident reports and interpret hazard information.

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

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations that will include disruptions to normal, smooth operation.

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

Consistent safe working is the critical aspect for which evidence should be sought.

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- recognise potential situations requiring action
- implement appropriate corrective action.

Consistent performance should be demonstrated. For example, look to see that relevant workplace procedures are understood, in particular:

- hazard policies and procedures
- emergency, fire and accident procedures
- procedures for the use of personal protective clothing and equipment
- hazard identification and risk assessment procedures.

The following should also be known and understood:

- the hazards and potential risks in the workplace
- the consultation processes, either general or specific to OHS
- OHS information (what is there and how to access it)
- specific hazard policies procedures.

These aspects may be best assessed using a range of scenarios/case studies and 'what ifs' as the stimulus with a walk through forming part of the response. These assessment activities should cover a range of problems, including new, unusual and extreme situations, which may have been generated from the past incident history of the workplace, incidents on similar plants around the world, hazard analysis activities and similar sources.

Assessment method and context

Assessment for this unit of competency will be on a manufacturing site or in a manufacturing environment.

Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what if' scenarios both in the workplace (during demonstration of normal operations and walk throughs of abnormal operations) and off the job.

It is expected that this competency may be applicable in combination with other industry, occupation or workplace-specific competencies. In all cases it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Specific resources for assessment

Assessment will require access to a manufacturing environment over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies and 'what ifs' will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit 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 unit of competency describes OHS requirements applicable for all workers whose work involves the use of workplace policies and procedures to maintain a safe work environment for themselves and others.

It is expected that workers will be provided with clear directions, information, instruction, training and appropriate supervision regarding the relevant State/Territory OHS legislation, codes of practice, relevant industry standards, workplace procedures and work instructions.

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.

Identify hazards

Hazard identification is the identification of known hazards in the workplace such as might be included in procedures, training and other workplace methods of identifying hazards.

Assess risks

Risk assessment is used in compliance with the relevant OHS acts and regulations. Assessment is to the extent required by the acts and regulations and is as relevant to the job.

Identify hazard controls

Identification of hazard controls is identifying the controls specified in the procedures or similar. Reviewing their effectiveness includes checking that they are in place and operational in accordance with standard procedure.

Tools and equipment

This competency includes use of equipment and tools such as:

- PPE
- handling aids
- other safety equipment.

Personal Protective Equipment (PPE)

Typical PPE includes:

- hard hats
- goggles/glasses/face shields

- hearing protection (ear muffs, plugs)
- dusk masks/canister masks/ SCBA/ long range breathers
- gloves/gauntlets
- safety boots
- antistatic equipment
- overalls/aprons/acid jackets/pants.

Selecting and using PPE includes:

- outlining the functions for each type of PPE used in the work environment
- identifying the situations in which specific types of PPE would be used
- using PPE correctly as required in a working environment.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights,
- confined spaces
- heat
- noise
- dusts or vapours
- fire and explosion
- dangerous goods.

Personnel

Appropriate personnel for OHS referrals may include:

- employer
- supervisor
- employees elected as OHS representatives
- other personnel with OHS responsibilities.

OHS Issues

OHS issues which may need to be raised by workers with designated personnel may include:

- recognition of hazards/methods of identifying hazards
- problems encountered in controlling risks associated with hazards (any of the controls as per the hierarchy of control which are relevant)
- observation of an injury and/or incident which occurred in the workplace
- clarification of understanding of OHS policies and procedures.

Recognise emergency situation

Recognition of emergency situations is from alarms, signals or other obvious mechanisms in the workplace.

Unit Sector(s)

Not applicable.

MSAPMOHS205A Control minor incidents

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit covers control of minor incidents. The competency would be possessed generally by most/all operations personnel and some non-operations personnel. It would require training in addition to that which might typically be part of an induction program, but does not require specialist training such as is given to members of an incident response team. The general purpose of this initial response is to prevent any incident from escalating. In the event of an incident this person may be expected to respond to an incident team member in line with procedures.

This unit does NOT apply to major incidents (see *MSAOHS210A Control non-fire incidents* and *MSAOHS212A Control fire incidents*).

Application of the Unit

Application of this unit

This competency applies to operators who may be called upon to control small incidents in the workplace.

It includes:

- fires of the A,B,C,D,E and F classes
- fuel and other spills
- process overheating
- equipment failure.

The person would:

- safely use first response equipment and coordinate with other actions
- operate incident equipment
- report the use of incident equipment
- mark or position incident equipment to indicate that it has been used and requires servicing.

Generally the person would be part of a team during an incident response. However, he/she may be required to take independent action. At all times they would be liaising and cooperating with other members of the team.

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. Evaluate the incident	1.1 Recognise an incident has occurred or is about to occur. 1.2 Assess the incident for type of response and the likely effectiveness of first response action. 1.3 Identify the hazards arising from the incident.

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.
	1.4 Raise the alarm and seek assistance as required. 1.5 Select appropriate response to control incident. 1.6 Determine hazard control measures to be employed. 1.7 Recommend evacuation if appropriate.
2. Control the incident.	2.1 Maintain personal safety at all times. 2.2 Confine the incident to the area of origin where possible. 2.3 Select appropriate equipment to control incident. 2.4 Use equipment in accordance with procedures. 2.5 Clear and secure the incident area. 2.6 Monitor the incident and surrounding conditions and modify response as appropriate. 2.7 Handover to specialist incident response personnel as appropriate.
3. Conclude the incident control.	3.1 Report the use of equipment according to procedures. 3.2 Mark or position incident control equipment after use to indicate it requires servicing or replacing. 3.3 Participate in incident debrief and reporting in accordance with procedures.

Required Skills and Knowledge

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

The knowledge referred to in the Evidence Guide for this unit includes:

- classification of fires and incidents
- limitations of first response equipment
- situations that must not be responded to because of the risk to life
- the hazards involved with first response action
- understanding relevant workplace procedures
- selecting appropriate first response equipment
- understanding the theory of fire and other relevant incidents.

Competence also includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- damage to first response equipment
- exceeding the limitations of use of incident control equipment or facilities
- inappropriate actions when first response action is undertaken
- inadequacies in facilities that may be used to confine emergencies
- inappropriately identifying the type of incident
- the incorrect use of equipment.

Language, literacy and numeracy requirements

This unit requires the ability to recognise and respond to the signs of an incident and communicate to relevant people as part of the response.

Writing is required to the level of completing required workplace forms and reports.

Numeracy is required to respond to relevant incident data.

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

Assessment will occur using a simulation and will be undertaken in a work-like environment.

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:

- correctly respond to incident situations
- implement appropriate action.

Emphasis should be on the ability to stay ahead of the problem rather than to have to take drastic action in order to recover the situation.

Consistent performance should be demonstrated. For example, look to see that:

- the incident is evaluated appropriately
- an appropriate response to the incident, and appropriate response equipment, is selected
- the safety of persons is given the highest priority
- actions taken are effective and do not cause escalation or other incidents
- all reporting is completed in accordance with procedures.

These assessment activities should cover a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

Assessment method and context

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.

Competence in this unit may be assessed:

- in an appropriate, industrial scenario
- in a situation allowing 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 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 unit applies to all sectors of the industry.

This unit will assist individuals to meet some of their obligations under the relevant State/Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard for the Control of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code of Practice for the Control of Major Hazard Facilities [NOHSC:2016(1996)].

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.

All operations to which this unit applies are subject to stringent Health, Safety and Environment (HSE) requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Tools and equipment

This competency includes use of equipment and tools such as:

- fire doors
- fire sprinkler systems
- fire alarm systems
- First Aid kits
- fire extinguishers
- hose reels
- smoke vents
- spill control kits.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- determining the nature and size of the incident
- predicting the incident's likely development
- lack of support in an incident
- inappropriate or lack of a means of escape
- lack of availability of control equipment or facilities.
-

Unit Sector(s)

Not applicable.

MSAPMOHS210B Undertake first response to non-fire incidents

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This unit deals with recognising and responding to an emerging incident (except for fire) to provide an appropriate first response

Application of the Unit

Application of the unit	This competency applies to operators who are required to respond to an incident such as a leak, spill or other incident. The worker is not expected to deal with the emerging incident, but to provide an initial first response in order to contain the incident and/or secure the immediate area in order to minimise resultant damages and loss. In this unit it is assumed that the worker is acting according to established workplace procedures.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units	

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. Assess level of severity.	1.1. Recognise an incident has occurred or is about to occur. 1.2. Access hazard information as appropriate. 1.3. Assess frequency, duration, actual and potential outcome. 1.4. Evaluate and communicate in a timely and appropriate manner the location, nature and extent of the incident.
2. Undertake routine response to minimise affect of the incident.	2.1. Determine first response requirements to contain the incident or evacuate the affected areas. 2.2. Select the appropriate response from the incident procedures and equipment. 2.3. Apply incident procedures as appropriate. 2.4. Clear and secure the incident area. 2.5. Safely locate, access and operate incident response equipment.
3. Notify responsible authorities.	3.1. Follow incident reporting procedures. 3.2. Identify appropriate authorities and notify. 3.3. Clearly and unambiguously communicate information concerning the incident in a timely manner.
4. Undertake safe evacuation.	4.1. Evacuate the area in a safe and controlled manner when first response has failed to control the incident or has proven inappropriate. 4.2. Secure the immediate area of the incident to ensure no further loss occurs to people, equipment, materials, process and environment.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

Competence includes the ability to apply and explain procedures for:

- identifying hazard and emergency signs and labels
- evacuation of different areas
- operating various pieces of incident response equipment
- communicating details of an incident situation clearly.

Language, literacy and numeracy requirements

- This unit requires the ability to respond to data and information indicating an incident.
- Writing is required to the level of completing required workplace forms and reports.
- Numeracy is required to the level of interpreting and reporting relevant data.

Required knowledge:

- Knowledge and understanding of the incident response procedures and equipment, sufficient to recognise standard and non-standard situations and then determine the appropriate action which is consistent with operating guidelines.
- Knowledge of the relevant OHS and environmental requirements, and organisation standard operating procedures is required along with an ability to implement them in a manner that is relevant to incident response practices.
- Evidence of knowledge of all relevant workplace procedures will include:
 - principles of operation of the incident response equipment
 - hazards policies and procedures
 - incident, fire and accident procedures
 - procedures for the use of personal protective clothing and equipment
 - organisation standard operating procedures (SOPs).

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

The unit will be assessed in as holistic a manner as is

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

practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Assessment will occur with simulated industrial incidents and will be undertaken in a work-like environment.

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- recognise and analyse potential situations requiring action
- implement the appropriate corrective action.

The reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to minimise the affect of an incident situation.

Consistent performance should be demonstrated. For example, look to see that:

- incident situations are recognised and communicated promptly
- action is taken to ensure that the effects of the incident situation are controlled promptly
- potential to involve others in the incident is recognised and appropriately communicated
- incident procedures are understood and followed.

These aspects may be best assessed using a range of scenarios/case studies and 'what ifs' as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the workplace, incidents on similar plants around the world, hazard analysis activities (eg HAZOP) and similar sources.

Context of and specific resources for assessment

Assessment for this unit will be on a processing plant or in a manufacturing environment.

Assessment will require access to an operating plant or manufacturing environment over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of

EVIDENCE GUIDE

Method of assessment Guidance information for assessment	situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions. This unit requires a body of knowledge which will be assessed through questioning and the use of 'what if' scenarios both in the workplace (during demonstration of normal operations and walk throughs of abnormal operations) and off the job. In all cases it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>PMPOHS200 Participate in workplace safety procedures</i> • <i>PMASUP220 Monitor and control environmental hazards.</i> Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays. 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**

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.

RANGE STATEMENT	
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency covers all emerging incidents except for fire.
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. All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Tools and equipment	This competency includes use of equipment and tools as required for the situation such as: • personal protective equipment such as breathing apparatus • incident response equipment such as hand held extinguishers, hose reels, fire blankets • evacuation equipment • survival equipment • standard operating procedures (SOPs) • external personnel such as: • police • fire brigade • ambulance.
Hazards	Typical hazards include: • chemicals and hazardous materials • gases and liquids under pressure • moving machinery • materials handling • working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours.
Problems	'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include: • accidents • chemical or oil spills

RANGE STATEMENT	
	• gas leak or vapour emission • utilities failure • bomb scares.
Personnel	Appropriate personnel for OHS referrals may include: • employer • supervisor • employees elected as incident team leader • other personnel with incident team leader responsibilities.
OHS issues	OHS issues which may need to be raised by workers with designated personnel may include: • recognition of different types of emergencies • problems encountered in control measures and implementation • observation on injury and/or incident occurred in the workplace.
Required functions	Required functions include: • containment of incident, eg chemical/oil spill or gas/vapour leak • communication with internal and external personnel.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector	

Competency field

Competency Field	

Co-requisite units

Co-requisite Units		

MSAPMOHS212A Undertake first response to fire incidents

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit is designed to ensure that an appropriate first response to fire incidents in onshore and offshore situations/emergencies is achieved.

Application of the Unit

Application of this unit

This competency applies to operators who are required to respond to fires in the workplace (other than evacuating to the assembly point). It covers the first response (only) to fire, and does not include aggressive fire fighting. Typically this response would be undertaken to contain/extinguish a minor fire or to contain a more major fire while external help arrived.

An ability to work under supervision and/or alone is required. This competency may be delivered as part of an induction program.

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 fire emergency and raise alarm.	1.1 Evaluate and communicate the location, nature and extent of the fire emergency in a timely and appropriate manner. 1.2 Determine first response requirements in order to evaluate the need to attack the fire emergencies or evacuate the affected areas.
2. Initiate basic fire responses.	2.1 Maintain personal safety at all times in accordance with OHS guidelines. 2.2 Put on appropriate protective clothing in accordance with organisation <u>procedures</u>. 2.3 Select appropriate extinguishing agents based on knowledge of fire and fuel types. 2.4 Operate basic fighting equipment safely, according to manufacturer specifications and organisation procedure, in order to contain the fire emergency. 2.5 Observe changing conditions at the fire and their effects on fire behaviour are noted and reported.
3. Notify responsible authorities.	3.1 Follow emergency reporting <u>procedures</u>. 3.2 Identify appropriate authorities and notify. 3.3 Clearly and unambiguously communicate information concerning the emergency in a timely manner.
4. Undertake safe evacuation.	4.1 Evacuate area in a safe and controlled manner when first response has failed to control the fire emergency, or has proven inappropriate.

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.
	4.2 Secure immediate area of the emergency to ensure no further loss occurs to people, equipment, process and environment.

Required Skills and Knowledge

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

Knowledge and understanding of the process sufficient to recognise fire situations and then determine an action that is appropriate within operating guidelines and the scope of their responsibilities and competencies. It would be expected that a person would have skills in fire identification, assessment and application of control measures and be able to demonstrate the use and application of a range of first response fire fighting safety equipment.

A person undertaking this competency must be able to demonstrate knowledge of:

- site specific alarm procedures
- characteristics of fire and fuel types
- composition and uses of extinguishing agents
- basic fire fighting equipment
- site or organisation emergency procedures and response plans
- site specific isolation procedures
- liaison techniques with third parties
- procedures to isolate pipeline sectors.

Language, literacy and numeracy requirements

This unit requires the ability to identify different fire fighting media and different fuels.

Writing is required to the level of completing required workplace reports/forms.

Numeracy is required to interpret and report relevant data.

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

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

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:

- recognise and analyse potential situations requiring action
- implement appropriate corrective action.

The emphasis should be on the ability to minimise the effects of the critical situation

Consistent performance should be demonstrated. For example, look to see that:

- identification of different types of fires
- selection and use of appropriate extinguishing agent
- application of defensive fire fighting tactics and techniques
- selection and use of appropriate protective clothing.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the workplace, incidents on similar plants around the world, hazard analysis activities (eg HAZOP) and similar sources.

Assessment method and context

Assessment for this unit of competency will be on an operating plant or in a manufacturing environment.

Assessment will occur using a simulated fire and will be undertaken in a work-like environment.

Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what if scenarios both in the workplace (during demonstration of normal operations and walk throughs of abnormal operations) and off the job.

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with PMPOHS200 Work safely.

Specific resources for assessment

Assessment will require access to an operating plant or manufacturing environment over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

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

Those persons working, operating or who regularly travel within an onshore or offshore installation or facility would require this competency.

This unit could be applied to any of the following installation or facilities:

- factories and production plants
- onshore/offshore rig/installation
- island based facility
- floating production vessel or platform
- onshore production, processing pipeline systems and/or storage facilities
- pipeline easements
- maintenance bases.

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.

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Tools and equipment

This competency includes use of equipment and tools such as:

- personal protective equipment
- such as breathing apparatus
- hand held extinguishers
- hose reels
- fire blankets

- smoke or self rescue respirators
- mobile and portable equipment
- First Aid equipment
- pipeline repair clamps
- lamb air movers
- barricades and signage
- communications equipment: two-way radios, mobile and satellite phones and pagers
- fire extinguishing media, including water, foam, extinguishing powder, gaseous extinguishing agents, vapourising liquids, other fire extinguishing substances.

Hazards

Typical hazards include:

- smoke, darkness and heat
- electricity
- gas
- structural hazards
- structural collapse
- industrial - machinery, equipment, product
- hazardous products and materials
- unauthorised personnel.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'.

Variables

Key variables to be monitored include:

- failure to control fire with first response methods
- adverse change in weather conditions
- change in flame colour and size
- change in smoke colour
- fire spread and/or other material becoming involved in fire
- signs of structural collapse.

Tactics

Fire fighting tactics may include:

- direct attack
- indirect attack
- combination attack
- exposure protection

but does NOT include internal/offensive attacks.

External personnel

External personnel may include:

- police
- fire brigade
- ambulance.
-

Unit Sector(s)

Not applicable.

MSAPMOHS216A Operate breathing apparatus

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit covers competence associated with the operation and maintenance of breathing apparatus equipment in an irrespirable atmosphere.

Application of the Unit

Application of this unit

This competency applies to operators who are required to wear breathing apparatus for part of their job - because they are working in a confined space, with hazardous gases/vapours, in an anoxic atmosphere or for other applications requiring the wearing of breathing apparatus. They may also be required to wear it in emergency situations, however this is not the prime focus of this unit, and so makes this unit different from *PUAFIR207A Operate breathing apparatus open circuit*, as it has no prerequisite and is much broader in its application.

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. Conduct pre-donning checks and tests on breathing apparatus.	1.1 Inspect breathing apparatus for immediate use in accordance with procedures. 1.2 Report/record faulty or damaged equipment in accordance with procedures.
2. Operate breathing apparatus.	2.1 Identify, monitor and control hazards in accordance with the procedures. 2.2 Establish and maintain communication with appropriate personnel throughout the activity. 2.3 Demonstrate effective application of breathing apparatus, undertaking activities as a member of a team, in accordance with procedures. 2.4 Implement entrapment procedures in accordance with procedures. 2.5 Maintain personal safety at all times.
3. Conclude operations.	3.1 Close down breathing apparatus set in accordance with procedures. 3.2 Remove breathing apparatus set in accordance with procedures. 3.3 Undertake after-use cleaning and maintenance of breathing apparatus in accordance with procedures. 3.4 Make equipment ready for operational use in accordance with procedures.

Required Skills and Knowledge

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

Underpinning knowledge:

- respiratory system, effects of irrespirable atmospheres on the body, protective equipment
- characteristics, component parts, operation of compressed air breathing apparatus
- operational testing, standard operating procedures and safe work practices when wearing breathing apparatus
- operating breathing apparatus
- use of procedures, personal lines and tallies
- pre-use tests and checks, including serviceability of components, integrity of components, cylinder pressure, integrity of air flow system, ancillary equipment.
- breathing apparatus control, including principles of BA Control, organisation procedures, Stage 1 (one entry point), Stage 2 (multiple entry points), entry/exit control point, entry/exit control officer, timing device
- entrapment procedures, including cease all strenuous activity, activate the distress signal unit, remain calm, relocate to safest available place, call for assistance
- communications, including distress signal unit, portable radio, communications sets, signal lines, hand signals.

Underpinning skills:

- Inspecting, donning, operating in, removal, cleaning, maintaining and returning to operational status of breathing apparatus.

Language, literacy and numeracy requirements

This unit requires the ability to interpret any permits or other documentation associated with the wearing of breathing apparatus for the job.

Writing is required to the level of completing required workplace reports.

Numeracy is required to enable the determination of the available working time from a breathing apparatus set and similar activities.

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 competency as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Assessment will occur using industrial breathing apparatus and will be undertaken in a work-like environment.

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

In accordance with AS/NZ 17151716, it is essential that competence is demonstrated in the ability to:

- appropriately conduct pre-donning tests
- correctly don breathing apparatus
- operate breathing apparatus
- move in conditions of reduced visibility
- use breathing apparatus in emergency procedures
- follow organisation procedures
- correctly remove breathing apparatus
- return breathing apparatus to operational status.

Assessment method and context

Competence in this unit may be assessed:

- by using an appropriate, industrial breathing apparatus and scenarios
- in a situation allowing 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 breathing apparatus and associated 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 anyone required to wear breathing apparatus as part of their job.

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 breathing apparatus, including:

- open circuit
- airline equipment.

Hazards

Typical hazards include:

- fire
- failure to maintain a face seal
- exhaustion of air supply
- malfunction of equipment
- disorientation in smoke/darkness or confinement
- structural hazards and/or hazardous materials
- entrapment.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'.

Variables

Key variables to be monitored for an irrespirable atmospheres include

- heated atmospheres
- asphyxiating atmosphere (oxygen deficient)
- (non-skin absorption) toxic or poisonous atmosphere
- smoke or suspended particles/fibres in atmosphere.
-

Unit Sector(s)

Not applicable.

MSAPMOHS217A Gas test atmospheres

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit is about testing the working atmosphere to determine if it is safe for the proposed work. Testing involves the use of electronic test apparatus.

Application of the Unit

Application of this unit

In a typical scenario an individual may be required to carry out gas testing of an atmosphere prior to entering a specific area or workspace. The competency requires the person to interpret readings and take actions based on the interpretation.

This unit is modelled on the Public Safety unit PUA FIR307A Monitor hazardous atmospheres, but does not have the prerequisites, which are not required in the industrial context. The unit is more focused on the needs of that sector and has some wording changes.

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. Prepare for gas testing.	1.1 Determine type of gas/atmosphere to be tested. 1.2 Select and calibrate equipment in accordance with procedures. 1.3 Determine gas testing regime/sampling pattern required. 1.4 Identify hazards from possible atmosphere contaminants. 1.5 Implement hazard control measures, including use of appropriate personal protective equipment.
2. Test gas.	2.1 Use gas testing equipment to test gas as required. 2.2 Interpret and report readings. 2.3 Monitor gas on an ongoing basis as required. 2.4 Take required action(s) if readings are unacceptable.
3. Maintain equipment.	3.1 Clean and maintain gas testing equipment in accordance with procedures. 3.2 Inspect and fault find monitoring equipment in accordance with procedures. 3.3 Return gas testing equipment to required location and in required condition. 3.4 Maintain records of tests and results in accordance with procedures.

Required Skills and Knowledge

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

As may be relevant to the plant/site/process, knowledge of the following may be required:

- common chemical asphyxiants, including hydrocarbons, carbon dioxide, carbon monoxide, hydrogen cyanide, and hydrogen sulphide
- common irritants and corrosives, including chlorine, ammonia and acid bases
- common flammable gases, including acetylene, petroleum, methane, ethane, propane and butane
- narcotics
- (explosive range, upper and lower explosive limits)
- exposure standards (time weighted average, short term exposure limits, peak limitation values, examination of toxic effect at the level of a range of flammable gases)
- conditions under which atmospheres become hazardous
- units of measurement used to express concentration of atmospheric contaminants (mg/cubic m. ppm, % v/v).

Underpinning skills could include interpretation and communication of results of sampling.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret a meter and then communicate the conclusions.

Writing is required to the level of completing required workplace reports/forms.

Numeracy read the instrument and interpret the results as being safe/not safe and so determine the required actions.

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 personal safety principles
- interpret atmospheric conditions using atmospheric monitoring equipment
- recommend appropriate action
- maintain monitoring equipment.

Consistent performance should be demonstrated. For example, look to see that:

- gathered evidence covers a range of variables, all using different types of monitoring equipment.

Assessment method and context

Assessment will occur using industrial test equipment on an industrial site/plant and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- through written assignments
- by a demonstration activity using workplaces/atmospheres with detectable but safe levels of contaminants should be used
- 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 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

Working environment may be hazardous, unpredictable, subject to time pressure, chaotic and expose responders to risk, on land or water, by day or night.

Safety information and procedures must include relevant legislation, Australian Standards, codes of practice, manufacturer instructions and organisational procedures.

Situations include

- confined spaces
- enclosed and partially enclosed spaces
- storage tanks, silos, pits, pipes, shafts, ducts, transport vehicles and ships
- testing as part of issuing a work permit
- monitoring as part of working under a work permit
- open areas
- holding the gas tester by hand
- lowering the gas tester into a space, eg on a line.

Workplace atmospheres may

- include visible and invisible hazards
- include hazardous surfaces
- range from safe to unsafe.

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.

All operations to which this unit applies are subject to stringent Health, Safety and Environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Tools and equipment

This competency includes use of equipment and tools such as:

- portable instruments
- radiation detectors
- sampling tubes and pumps
- oxygen level meter
- carbon monoxide detector
- combustible gas detectors.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'.

Unit Sector(s)

Not applicable.

MSAPMOHS220A Provide initial First Aid response

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit deals with the provision of essential First Aid in recognising and responding to an emergency using basic life support measures.

Application of the Unit

Application of this unit

This competency applies to operators who have a First Aid role as part of their job. The 'first aider' is not expected to deal with complex casualties or incidents, but to provide an initial response where First Aid is required. In this unit it is assumed the 'first aider' works under supervision, either individually or as part of a team, and/or according to established workplace First Aid procedures and policies.

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. Assess the situation.	1.1 Identify physical hazards to own and others' health and safety. 1.2 Minimise immediate risk of hazard to self and casualty's health and safety in accordance with OHS requirements. 1.3 Assess the casualty's vital signs and physical condition in accordance with workplace procedures.
2. Apply basic First Aid techniques.	2.1 Provide First Aid management in accordance with established First Aid procedures. 2.2 Reassure and make casualty comfortable in a caring and calm manner using available resources. 2.3 Seek First Aid assistance from others in a timely manner and as appropriate. 2.4 Monitor and respond to casualty's condition in accordance with effective First Aid principles and workplace procedures. 2.5 Accurately record details of casualty's physical condition, changes in conditions, management and response to management in line with organisational procedures. 2.6 Finalise casualty management details according to casualty's needs and First Aid principles.
3. Communicate details of the incident.	3.1 Request medical assistance using relevant communication media and equipment. 3.2 Accurately convey details of casualty's condition and management activities to emergency

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.
	services/relieving personnel. 3.3 Prepare reports to supervisors in a timely manner, presenting all relevant facts according to established company procedures.

Required Skills and Knowledge

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

Knowledge and understanding of basic life support measures sufficient to provide an initial response where First Aid is required within the scope of their responsibilities and competencies.

Knowledge and application of the Australian Resuscitation Council (ARC) guidelines.

The following knowledge should be demonstrated in assessment:

- basic anatomy and physiology
- company standard operating procedures (SOPs)
- legal responsibilities and duty of care
- dealing with confidentiality
- knowledge of the first aiders' skills and limitations
- Occupational Health and Safety legislation and regulations and requirements
- how to gain access to and interpret materials safety data sheets (MSDSs)
- First Aid management
- State and Territory workplace health and safety requirements
- allergies the casualty may have
- location and nature of the workplace
- the environmental conditions, eg electricity, biological risks, weather, motor vehicle accidents
- location of emergency service personnel
- the use and availability of First Aid equipment and resources
- infection control
- established First Aid principles, including:
 - checking the site for danger to self, casualty and others and minimising the danger
 - checking and maintaining the casualty's airway, breathing and circulation.

Evidence should demonstrate the following skills:

- resuscitation
- demonstration of First Aid casualty management principles - assessing and minimising danger, maintaining the casualty's airway, breathing and circulation
- safe manual handling of casualty
- consideration of the welfare of the casualty
- report preparation
- communication skills
- ability to interpret and use listed documents.

Underpinning knowledge and skills:

- basic anatomy and physiology
- duty of care
- resuscitation
- bleeding control
- care of unconscious
- infection control
- airway management
- State/Territory regulatory requirements relating to currency of skills and knowledge
- decision-making
- legal requirements
- assertiveness skills
- communication skills.

Language, literacy and numeracy requirements

This unit requires the ability to communicate both verbally and in writing with relevant people regarding the casualty's condition and treatments initiated.

Writing is required to the level of completing required workplace forms and reports.

Numeracy is required to read, interpret and report numeric data relevant to the casualty and the treatments.

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.

Assessment will occur using industrial treatment scenarios and will be undertaken in a work-like environment.

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:

- work individually, under supervision or as part of a First Aid team.

Assessment method and context

Competence in this unit may be assessed:

- by using appropriate, industrial scenarios
- in a situation allowing 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.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMPOHS200 Work safely
- PMASUP220 Monitor and control environmental hazards.

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 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 people with a First Aid role.

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:

- defibrillation units
- pressure bandages
- thermometers
- First Aid kits
- eyewash
- thermal blankets
- pocket face masks
- rubber gloves
- dressing
- spacer device
- cervical collars
- mobile phones
- satellite phones
- HF/VHF radio
- flags
- flares
- two way radio
- email
- electronic equipment
- medication which includes aerosol bronchodilators for asthma; casualty's own (or from First Aid kit) in accordance with State/Territory legislation, adrenaline for severe allergic reactions; subject to casualty's own regime.

Hazards

Typical hazards include:

- workplace hazards
- environmental hazards
- proximity of other people
- hazards associated with the casualty management process.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'.

Variables

Key variables to be monitored include:

- vital signs, including breathing, circulation, consciousness.

Variables indicating the casualty's condition, including:

- abdominal injuries
- allergic reactions
- bleeding
- burns - thermal, chemical, friction, electrical
- cardiac conditions
- chemical contamination
- cold injuries
- crush injuries
- dislocations
- drowning
- envenomation - snake, spider, insect and marine bites
- environmental conditions such as hypothermia, dehydration, heat stroke
- epilepsy, diabetes, asthma and other medical conditions
- eye injuries
- fractures
- head injuries
- minor skin injuries
- neck and spinal injuries
- needle stick injuries
- poisoning and toxic substances
- respiratory management of asthma and/or choking
- shock
- smoke inhalation
- soft tissue injuries, including sprains, strains, dislocations
- substance abuse, including drugs
- unconsciousness, including not breathing and no pulse.

Risks

Risks may include:

- worksite equipment, machinery and substances
- environmental risks
- bodily fluids
- risk of further injury to the casualty
- risks associated with the proximity of other workers and bystanders.
-

Unit Sector(s)

Not applicable.

MSAPMOHS300A Facilitate the implementation of OHS for a work group

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

On completion of this unit, the worker will be able to implement and monitor defined OHS policies and procedures for a work group or area, within their scope of responsibilities.

Application of the Unit

Application of this unit

This competency applies to operators who are capable of coaching the team in participating and contributing to OHS management issues. The worker will be able to perform duties that are required of a safety committee member or safety representative in an organisation. Typically this worker might be a team leader or on the OHS committee.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has the prerequisite of *MSAOHS200A Work safely*.

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. Communicate OHS information for co-workers in team.	1.1 Accurately and clearly explain to the work group basic OHS rights, responsibilities and requirements. 1.2 Provide, in a readily accessible manner, information on the relevant organisation OHS policies, procedures and programs, and accurately and clearly explain them to the work group. 1.3 Regularly provide relevant information about identified hazards and the outcomes of risk assessment and risk control procedures, and accurately and clearly explain them to the work group.
2. Coach co-workers in team.	2.1 Establish mutual support groups, eg buddy system, to encourage effective development of individual and group competencies in OHS. 2.2 Provide personal encouragement and assistance to team members to contribute to the management of OHS at the workplace.
3. Facilitate the consultative process.	3.1 Deal with, and promptly resolve, issues raised through consultation or refer to the appropriate personnel for resolution in accordance with workplace procedures. 3.2 Seek input from work group on OHS issues and proposed changes to process, procedures or work place. 3.3 Encourage and use feedback from individuals and teams to identify and implement improvements in the

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.
	management of OHS. 3.4 Promptly inform the work group of the outcomes of consultation over OHS issues.
4. Implement and monitor organisation procedures for identifying hazards, and assessing and controlling risk.	4.1 Implement and monitor adherence to work procedures to identify hazards and assess and control risk. 4.2 Monitor existing risk control measures and report results regularly. 4.3 Access internal and external sources of relevant OHS information. 4.4 Evaluate and identify inadequacies in existing risk control measures in accordance with the hierarchy of control, and report to designated personnel. 4.5 Identify inadequacies in resource allocation for implementation of risk control measures and report to designated personnel. 4.6 Identify actual/potential inadequacies in procedures and report to designated personnel. 4.7 Identify actual/potential inadequacies in individual or team competency and report to designated personnel.
5. Maintain and use OHS records.	5.1 Accurately and legibly complete OHS records for work area, in accordance with workplace requirements for OHS records and legal requirements for the maintenance of records of occupational injury and disease. 5.2 Use aggregated information from the area OHS records to identify hazards and monitor risk control procedures within work area according to procedures and within scope of responsibilities and competencies.

Required Skills and Knowledge

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

Knowledge and understanding of the workplace OHS system and State OHS legislative requirements, codes of practice and relevant industry standards sufficient to implement and monitor OHS activities for a work group or area within the scope of their responsibilities and competencies.

In these industries which are characterised by high potential hazard, employees need to exercise their duty of care responsibilities not only within the general OHS Acts and regulations, but also within those State and national standards applying to hazardous substances, dangerous goods and major hazards.

Competence includes the ability to apply and describe the:

- identification of hazards in the workplace and standard controls
- assessment of risk and implementation of risk control measures
- rights and responsibilities of employees under OHS legislation
- obligations of employers under the OHS legislation
- legislative requirements for information and consultation
- arrangements for consultation within the workplace
- management systems and procedures for OHS
- the hierarchy of control
- hazard policies and procedures
- safety procedures
- emergency, fire and accident procedures.

Competence also requires the ability to:

- locate, understand and follow workplace OHS procedures
- identify and communicate with all key personnel in the organisation
- identify and access relevant sources of information
- interpret OHS data such as tables of numbers and graphs
- select, recommend and use personal protective clothing and equipment.

Language, literacy and numeracy requirements

This unit requires the ability to communicate with members of the work team/area and also management. It also requires the ability to interpret and apply OHS procedures and explain them to work team members.

Writing is required to the level of being able to keep records as required and also keep notes from meetings.

Numeracy is required to interpret incident statistics and hazard data.

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

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations that will include disruptions to normal, smooth operation.

Where the assessee does not currently possess evidence of competency in *MSAOHS200A Work safely*, it may be co-assessed with this unit.

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:

- communicate effectively with the work group(s)
- proactively promote consultation and participation in the OHS processes
- participate in decisions which impact on OHS for their workgroup.

Consistent performance should be demonstrated. In particular look for knowledge and understanding of:

- specific hazard policies and the use of hazard procedures (eg identify, assess, control)
- the consultation processes, either general or specific to OHS
- OHS information
- OHS record keeping
- counselling, disciplinary and issue resolution processes.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should cover a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the workplace, incidents on similar plants around the world, hazard analysis activities and similar sources.

Assessment method and context

Assessment for this unit of competency will be on a processing plant or in a manufacturing environment.

Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what if' scenarios both in the workplace (during demonstration of normal operations and walk throughs of abnormal operations) and off the job.

It is expected that this competency may be applicable in combination with other industry, occupation or workplace-specific competencies. In all cases it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Specific resources for assessment

Assessment will require access to an operating plant or manufacturing environment over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

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 unit describes OHS requirements applicable for all workers who are responsible for the organisation of OHS arrangements for a work group or area, including coaching.

It is expected that workers will be provided with clear directions, information, instruction, training and appropriate supervision regarding the relevant State/Territory OHS legislation, codes of practice, relevant industry standards, workplace procedures and work instructions.

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.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or in environments subjected to heat, noise, dusts or vapours
- fire and explosion.

Personnel

Appropriate personnel for OHS referrals may include:

- employer
- supervisor
- employees elected as OHS representatives

- other personnel with OHS responsibilities.

Participative arrangements

Participative arrangements for OHS management may involve:

- making safety suggestions
- information sessions on existing or new issues
- meetings between employer and employees or representatives
- access to relevant workplace information
- use of clear and understandable language.

OHS Issues

OHS issues which may need to be raised by workers with designated personnel may include:

- recognition of hazards
- problems encountered in controlling risks associated with hazards
- clarification of understanding of OHS policies and procedures.

OHS Records

OHS records include:

- hazard and incident reports
- logs/logs sheets
- inspection/start up/shut down checklists
- injury reports
- maintenance records.

OHS Information Sources

Relevant sources of OHS information include:

- OHS legislation and codes of practice
- industry standards for materials, process, equipment etc
- SA/ISO standards
- OHS authorities
- unions and industry associations
- internet, journals, magazines
- manufacturer/supplier manuals/specifications
- policies and procedures
- JSA, risk assessments, HAZOPs
- hazard, incident and injury records
- training resources
- employee information brochures, newsletters etc
- OHS reports such as inspections, technical reports.
-

Unit Sector(s)

Not applicable.

MSAPMOHS400A Contribute to OHS management system

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

On completion of this unit, the worker will be able to contribute to the workplace occupational health and safety (OHS) management system and ensure that the workplace is, so far as is practicable, safe and without risks to the health of workers.

Application of the Unit

Application of this unit

This competency applies to personnel who are required to implement, monitor and improve the OHS management system. It typically applies to an OHS expert, or a supervisor or manager who has OHS particular responsibilities.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has the prerequisite of *MSAOHS300A Facilitate the implementation of OHS for a work group*.

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. Establish and review procedures for identifying hazards, and assessing and controlling risk.	1.1 Access current, relevant information on legislative and industry requirements for hazard identification and risk assessment and control. 1.2 Identify gaps in procedures. 1.3 Develop workplace procedures to meet requirements. 1.4 Involve relevant stakeholders in procedures development. 1.5 Review the procedures on a regular basis by consulting stakeholder groups for feedback. 1.6 Inform relevant stakeholders and other work groups of any changes and implement changes in the procedures.
2. Establish and review incident procedures	2.1 Identify legal and organisation requirements. 2.2 Identify gaps in procedures. 2.3 Develop workplace procedures for dealing with incidents. 2.4 Review the procedures by consulting stakeholder groups for feedback. 2.5 Inform relevant stakeholders and other work groups of any changes and implement changes in the procedures.
3. Implement and review training program from an OHS perspective.	3.1 Identify the legal, organisational and practical requirements for OHS training. 3.2 Evaluate the workplace training program for OHS gaps.

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.
	3.3 Review the program on a regular basis by consulting stakeholders and work groups for feedback. 3.4 Take appropriate action to incorporate relevant feedback into the revised program. 3.5 Inform relevant work groups of any changes and implement changes in the OHS training program.
4. Implement and review OHS recording system.	4.1 Identify the legal and organisational requirements for OHS records. 4.2 Evaluate the workplace OHS recording system for gaps. 4.3 Review the system on a regular basis by consulting stakeholders and work groups for feedback. 4.4 Incorporate relevant feedback into the revised system in consultation with stakeholders. 4.5 Inform relevant work groups of any changes and implement changes in the management of OHS record.

Required Skills and Knowledge

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

Knowledge and understanding of the workplace OHS system and State OHS legislative requirements, codes of practice and relevant industry standards sufficient to contribute to the workplace OHS management system for a work group or area within the scope of their responsibilities and competencies.

In these industries which are characterised by high potential hazard, team leaders and supervisors must be aware that employees need to exercise their duty of care responsibilities. This will be not only within the general OHS Acts and regulations, but also within those State and national standards applying to hazardous substances, dangerous goods and major hazards.

Competence includes the ability to apply and describe the:

- identification of hazards common to the industry and standard controls
- rights and responsibilities of employees under OHS legislation
- obligations of employers under the OHS legislation
- legislative requirements for information and consultation

- legislative requirements for record keeping and reporting
- appropriate consultation arrangements for the industry
- numeracy, literacy and other communication skills of work group(s)
- duty of care of employers and employees
- hierarchy of control.

Competence also requires the ability to:

- access and use the current OHSMS
- access and interpret training records
- identify and communicate with all key personnel in the organisation
- identify and access relevant sources of information.

Knowledge of related management systems, eg purchasing and IT, is also required.

Language, literacy and numeracy requirements

This unit requires the ability to interpret and apply complex documents with specific technical jargon.

Writing is required to the level of drafting policy and procedures.

Numeracy is required to the level of interpreting statistics and hazard data and setting up appropriate safety measurements.

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

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations that will include disruptions to normal, smooth operation.

Where the assessee does not currently possess evidence of competency in *MSAOHS300A Facilitate the implementation of OHS for a work group*, it may be co-assessed with this unit.

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/describe the workplace OHS system and State OHS legislative requirements as well as the importance of critical procedures
- recognise and analyse potential situations that require action
- implement appropriate corrective action.

There should be an underpinning understanding of the duty of care responsibilities of employer and employees.

Consistent performance should be demonstrated. For example, demonstrated knowledge and understanding of:

- all relevant workplace procedures
- the requirements that the workplace procedures should meet
- the consultation processes, either general or specific to OHS
- training and assessment of training needs
- hazard identification, risk assessment and risk control methods
- the need for specific hazard management policies and procedures
- types and sources of OHS information
- OHS record keeping systems
- the system for and process of maintenance of plant and equipment
- OHS issue resolution processes.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the workplace, incidents on similar plants around the world, hazard analysis activities and similar sources.

Assessment method and context

Assessment for this unit of competency will be on a processing plant or in a manufacturing environment.

Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what if' scenarios both in the workplace (during demonstration of normal operations and walk throughs of abnormal operations) and off the job.

It is expected that this competency may be applicable in combination with other industry, occupation or workplace-specific competencies. In all cases it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Specific resources for assessment

Assessment will require access to an operating plant or manufacturing environment over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies and 'what ifs' will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

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 unit covers live, real time and ongoing routine hazard identification and risk assessment.

This unit describes OHS requirements applicable for those with responsibilities for contributing to the workplace OHS management system within a work group or area. This may be as a team leader or as a supervisor. Roles and responsibilities will vary from organisation to organisation.

Review of activities may include review of written reports, performance appraisal or auditing procedures.

Competence is demonstrated in the context of an organisation where the OHS system with related policies, procedures and programs is already established. The role will relate to the maintenance and upkeep of the system.

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.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours
- fire and explosion.

OHS Information

Sources of relevant OHS information include:

- OHS legislation and codes of practice
- industry standards for materials, process, equipment etc
- SA/ISO standards
- OHS authorities

- unions and industry associations
- Internet, journals, magazines
- manufacturer/supplier manuals/specifications
- policies and procedures
- JSA, risk assessments, HAZOPs
- hazard, incident and injury records
- training resources
- employee information brochures, newsletters etc
- OHS reports such as inspections, technical reports.
-

Unit Sector(s)

Not applicable.

MSAPMOHS401A Assess risk

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

On completion of this unit, the worker will be able to identify hazards and operability problems and then analyse them by hazard analysis techniques to assess risk.

Application of the Unit

Application of this unit

A team with a broad knowledge of the system and its operation will carry out the analysis. It is expected that the risk assessment processes are already defined for the enterprise and that the risk acceptance criteria have already been established. The team will be steered by engineering experts or risk assessment specialists in the industry. This competency applies to workers who, in a typical scenario, take an active role in a HAZOP or similar methodology. They are not expected to lead the HAZOP. This unit is not restricted to HAZOPs and may be applied to other methodologies requiring similar competency. The risk assessment should be consistent with AS 4360 - Risk Management.

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 hazards and potential operability problems.	1.1 Contribute to the compiling of a system description of all the machinery, equipment, operations, products and materials relevant to the everyday working procedures of the facility. 1.2 Contribute to the compiling of a checklist containing process parameters (primary key words) and guide words (secondary key words) relevant to the system. 1.3 Identify hazards, existing control measures and potential operability problems or breakdowns in control measures using the compiled system descriptions and the checklist.
2. Assess impact of risk and determine alternative strategies.	2.1 Screen for causes of deviations and establish consequences. 2.2 Determine alternative strategies for action in relation to each deviation within the range of competency and responsibility. 2.3 Review, clarify and/or analyse risk information to determine its relevance and reliability depending upon the task assigned, level of competency and area of responsibility.
3. Assess risk information against established risk criteria in risk management plan.	3.1 Check risk acceptance criteria for any changes over past period. 3.2 Compare risk information against risk acceptance criteria and procedures to assess acceptability of risk.

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 Conduct liaison with other Internal departments to assess impact on business if applicable. 3.4 Document findings according to company policies and procedures.
4. Develop a risk register.	4.1 Develop a risk assessment chart for each system studied containing deviation, cause, consequence, control measures and action. 4.2 Develop action plan for implementation of control measures, including any changes to procedures. 4.3 Establish or review the procedures by consulting relevant/different work groups. 4.4 Inform relevant work groups of any changes and implement, within area of responsibility, changes in the procedures. 4.5 Monitor effectiveness of the control measures including revised procedures.
5. Establish and maintain procedures for identifying hazards, and assessing and controlling risk.	5.1 Identify and develop procedures for routine hazard identification, assessment and control of risks. 5.2 Address identification of all hazards at the planning, design and evaluation stages of any changes in the workplace to ensure that new hazards are not created by the proposed changes. 5.3 Develop and maintain procedures for selection and implementation of risk control measures in accordance with the hierarchy of control. 5.4 Identify inadequacies in existing risk control measures in accordance with the hierarchy of control and, within area of responsibility, promptly provide resources enabling implementation of new measures.

Required Skills and Knowledge

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

This unit requires the ability to apply a consistent risk assessment methodology which is appropriate to the workplace being assessed. One example of this is the HAZOP methodology, but other methodologies may be used.

Some understanding of quantitative risk assessment, such as HAZAN, is also required.

The requirements of the relevant OHS act and regulations with regard to risk assessment should be known and followed.

Knowledge includes:

- identification of hazards and how hazard controls may break down
- an understanding of risks and how they may be reduced
- the modelling and evaluation of a wide range of failure modes
- analysis which is auditable, repeatable, verifiable and usable by other staff
- analysis systems appropriate to the system operating in the given domain and appropriate for the particular life cycle phase at which it is to be applied
- determining valid results from data of the quality and quantity actually available
- use of standard pro-formas to support the technique
- a rational technical base which may include reference to national or international standards, defence standards or published reference books.

Language, literacy and numeracy requirements

This unit requires the ability to interpret process plant descriptions and drawings.

Writing is required to the level of making the required reports for the process.

Numeracy is required to interpret hazard and probability data and determine risk profiles.

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.

Assessment will occur by analysing an appropriate industrial site and will be undertaken in a work-like environment.

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:

- know and understand the workplace systems and the importance of critical procedures
- apply a working knowledge of all relevant workplace procedures.

Consistent performance should be demonstrated. For example, look to see that the techniques used:

- enable identification of hazards and how hazard controls may break down
- enhance the understanding of risks and how it may be reduced
- permit the modelling and evaluation of a wide range of failure modes
- enable the analysis to be carried out in a manner that is auditable, repeatable and verifiable
- are usable by other staff
- are appropriate to the system operating in the given domain
- give valid results from data of the quality and quantity actually available
- are appropriate for the particular lifecycle phase at which it is to be applied
- provide standard pro-formas to support the technique
- have a rational technical basis which may include reference to national or international standards, defence standards or published reference books.

These aspects may be best assessed using a range of scenarios/case studies and 'what ifs' as the stimulus with a walk through forming part of the response. These assessment activities should cover a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the plant/equipment, incidents on similar plants around the world, past hazard analysis activities and similar sources.

Assessment method and context

Competence in this unit may be assessed:

- on an appropriate, industrial plant/site
- in a situation allowing 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 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 unit will be completed as a specialist unit (eg by plant technicians) requiring technical knowledge.

The aim of this competency unit is to apply a methodical examination of the system and its elements to identify hazards and the states or conditions where there may be loss of control of the hazard and the resultant consequences. The results of the hazard analysis should be expressed clearly and concisely, and include where possible tables and diagrams. Team members would contribute their understanding of the process and particularly the operational aspects, and then carry out whatever tasks are assigned to them by the analysis team.

While this competency aims to enable a person to identify hazards and assess risk through a systematic approach, more than 80% of recommendations can be operability problems and are not, of themselves, hazards. Although hazard identification should be the main focus, operability problems should be identified to the extent that they have the potential to lead to a breakdown in hazard controls resulting in a health, safety or environmental violation or have a negative impact on profitability.

The degree of depth of a checklist should be dependent on the knowledge of the system at the time the study is carried out. This technique can therefore be applied at any stage of the project/process lifecycle.

Screening for deviations includes accessing internal and external data that may provide information about previous incidents or warnings of incidents. Sources of such information may include:

- internal hazard and incidents reports, maintenance records, audit reports
- reports from similar plants, factories, industry bodies, regulators, journals etc of actual incidents or reports that have relevance to the situation being analysed.

Examples of risk assessment tools may range from relatively simple to more complex HAZOP analyses and other methodologies requiring similar competency.

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.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours
- fire and explosion.

Problems

Typical process and product problems may include:

- incidents with a potential for injury
- fires, explosions
- chemical spills
- bomb scares.

Process Parameters

Specific process parameters (primary key words) relevant to the system may include:

- flow
- temperature
- pressure
- relief
- instrumentation
- sampling
- addition
- safety
- reaction
- reduce (grind, crush)
- absorb
- isolate
- vent
- start-up
- composition
- phase
- level
- corrosion
- erosion
- services

- utilities
- maintenance/maintain
- inserting
- purging
- contamination
- separate (settle, filter, centrifuge)
- mix
- drain
- shutdown.
-

Unit Sector(s)

Not applicable.

MSAPMOHS503A Maintain the workplace OHS management system

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the ongoing maintenance of the OHS management system (OHSMS) within the area of managerial responsibility, in order to ensure that the workplace is, so far as is practicable, consistently safe and without risks to the health and safety of employees. It assumes that the OHSMS has been developed by persons with the relevant specialist knowledge and skills.

Application of the Unit

Application of this unit

This competency applies to personnel with a specialised responsibility for maintaining the workplace OHSMS. This will typically be a manager, team leader or a technician with particular OHS responsibilities. The work will be carried out with the support of other team members.

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. Manage OHS information in the workplace	1.1 Take action to ensure that requirements for OHS record keeping and reporting are implemented according to workplace procedures and legislative requirements. 1.2 Access sources of OHS information and evaluate for application to the workplace. 1.3 Collect and collate data and information to provide information to managers and stakeholders on OHS requirements, trends and risk controls.
2. Support implementation of OHSMS	2.1 Determine OHS priorities in consultation with appropriate managers and stakeholders. 2.2 Identify OHS training needs for implementation and maintenance of the OHSMS. 2.3 Develop action plans taking account of priorities and training needs. 2.4 Monitor achievement of action plans and update plans accordingly.
3. Support OHS participative arrangements	3.1 Ensure OHS information and documentation is understandable and accessible to all. 3.2 Promptly address OHS issues that may arise within area of authority or refer to appropriate person. 3.3 Provide information about the outcomes of OHS consultation in a manner that is accessible to all.

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.
4. Collect data to evaluate currency of OHSMS.	4.1 Identify, in consultation with stakeholders and, as required expert advisors, internal data and information that provides relevant and reliable information on the performance of the OHSMS. 4.2 Conduct workplace inspections on a regular basis. 4.3 Identify workplace OHS implications of any changes to legislation. 4.4 Identify any OHS implications to proposed changes to the workplace. 4.5 Take action to arrange an OHSMS audit.
5. Analyse data and information to identify areas for improvement	5.1 Assess compliance of OHSMS with OHS legislation. 5.2 Analyse information collected to identify areas for improvement. 5.3 Consult with stakeholders, key personnel and, as required, OHS advisors. 5.4 Document and communicate outcomes of analysis to key personnel and stakeholders in an easily understood format. 5.5 Recognise limits of own expertise and seek appropriate advice.
6. Initiate and maintain improvements.	6.1 Determine priorities for OHS in consultation with stakeholder. 6.2 In consultation with stakeholders, develop an OHS plan with responsibilities and time frames. 6.3 Identify and source resources required for implementation of plan. 6.4 Monitor achievement against plan. 6.5 In consultation with stakeholders, monitor effectiveness of modifications to OHSMS on an ongoing basis.

Required Skills and Knowledge

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

Knowledge and understanding of the workplace OHSMS and State OHS legislative requirements, codes of practice and relevant industry standards sufficient to maintain, evaluate and improve the workplace OHS management system within the scope of their responsibilities and competencies.

Management must be aware that, while employees have OHS responsibilities, line managers are ultimately responsible, under both OHS legislation and common law duty of care, for the safety of the workplace, including ensuring that employees comply with documented work procedures. This legislation includes general OHS legislation as well as that for hazardous substances, dangerous goods and major hazard sites.

Competence in this unit includes the ability to apply a working knowledge of the workplace, relevant OHS legislation and OHSMS to:

- maintain an OHSMS already defined and established
- identify types of data and information that will provide information on the effectiveness of the OHSMS in minimising risk
- analyse the data to identify areas for improvement in elements of the OHSMS, including communication and consultation, reporting and hazard identification, risk assessment and risk control,
- develop strategies for improvement in the OHSMS
- apply the hierarchy of control to recommend actions to minimise risk
- OHS record keeping and reporting as required under:
 - hazardous substances and dangerous goods legislation
 - OHS legislative requirements to report serious incidents and injuries and keep records of risk assessments
- creation and management of other record such as:
 - hazard and incident reports, investigation reports
 - completed workplace inspection checklists and reports
 - external or internal reports
 - minutes of meetings.

Language, literacy and numeracy requirements

This unit requires the ability to communicate in all modes and at all levels conveying what is often technical content/ideas.

Writing is required to the level of writing the required reports and documents.

Numeracy is required to interpret and manipulate the necessary data.

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.

Assessment will occur on an industrial site and will be undertaken in a work-like environment.

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:

- interact with the workforce to maintain the process that comprise the OHSMS
- access and analyse information to identify areas for improvement
- develop appropriate improvement strategies
- apply a quality improvement process to implement and monitor change

Consistent performance should be demonstrated. For example, look to see that the required level includes a working knowledge of the workplace OHSMS. Look to see knowledge and understanding of:

- OHS responsibilities of all levels in the workplace
- the consultation processes, either general or specific to OHS
- hazard identification and risk assessment
- implementation of risk control measures by applying the hierarchy of control
- new and relevant OHS information
- OHS record keeping
- OHS issue resolution legislative requirements for consultation prior to the implementation of change
- sources and types of information that provide realistic information on the performance of the OHSMS
- techniques for analysing OHS data, including simple statistical analysis and graphing of trends
- types of internal and external change that may impact on OHS.

These aspects may be best assessed in a realistic workplace. Where this is difficult to access then steps should be taken to arrange access to realistic data and a visit to a workplace.

Scenarios and case studies may provide a suitable adjunct. These assessment activities should include a range of problems that may be encountered when maintaining reviewing and implementing improvement to the OHSMS.

Assessment method and context

Competence in this unit may be assessed:

- on an appropriate, industrial plant/site
- in a situation allowing 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 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 unit describes OHS requirements applicable for those with managerial responsibilities for maintaining and improving an established OHSMS within the organisation. This may be as a worker or as an owner of a business. This competency assumes that the OHSMS has been established by others, either internal or external and that expert advice is available either internally or externally.

The competency is to be exhibited within the area of managerial responsibility, which may be an entire organisation or department of an organisation. Roles and responsibilities will vary from organisation to organisation.

While relevant positions for maintaining and improving the OHSMS will include managers, OHS officers/managers it should be quite clear that the legal responsibility for OHS rests with the line managers.

Analysis of data may include statistical analysis, qualitative analysis or informal review.

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.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours
- fire and explosion.

OHS Information Sources

Sources of OHS information may be external and include:

- OHS legislation, codes of practice and Australian and International standards
- OHS regulators and Australian Safety and Compensation Council (ASCC)
- industry bodies
- Internet sites, journals and newsletters
- OHS policies and procedures
- manufacturer manuals
- risk assessments, JSAs, workplace inspections
- MSDSs and registers
- hazard and incident reports.
-

Unit Sector(s)

Not applicable.

MSAPMOHS510A Manage risk

Modification History

Release 2 – updated to be consistent with ISO 31000:2009 Risk Management – Principles and Guidelines. Previous unit referred to Australian Standard (AS/NZS 4360:1999). Reformatted - Equivalent.

Unit Descriptor

This unit covers the development, implementation and evaluation of an organisation-wide risk management plan. It incorporates an assessment of all potential risks facing the organisation and the approach, the management components and resources to be applied to the management of risk.

Application of the Unit

This unit applies to managers or work health and safety (WHS) specialists who are developing or maintaining a risk management plan for their site or organisation. This unit is based on ISO 31000:2009 Risk Management – Principles and Guidelines, and as such may be applied quite broadly. However, it is probably best applied to health, safety and environment risks and the business and other risks consequent on them.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MSAPMOHS401A Assess risk

Employability Skills Information

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

1	Develop risk management plan	1.1 Analyse and interpret strategic position and policy on risk management 1.2 Identify risk management context and potential areas of risk 1.3 Analyse organisational capability to manage risk and achieve objectives 1.4 Generate a comprehensive list of risks that could affect the achievement of the organisation's objectives 1.5 Establish or review risk management policies 1.6 Evaluate the requirement for training/education for all groups and individuals 1.7 Identify access to external specialist assistance 1.8 Establish appropriate risk assessment techniques 1.9 Consult stakeholders in the development of the plan
2	Implement risk management plan	2.1 Define, in consultation with stakeholders, the criteria used to evaluate the significance of risk 2.2 Evaluate and prioritise risks for treatment 2.3 Determine and select the most appropriate options for treating risks 2.4 Implement and monitor risk treatment plan 2.5 Document strategies for risk treatment options

3	Evaluate risk management plan	3.1	Establish procedures to regularly review risk management activities
		3.2	Ensure stakeholders have input to the review
		3.3	Examine activities that do not achieve their objective/ performance outcomes to determine cause
		3.4	Identify targets for improvement and update plan
		3.5	Establish evaluation of risk management as a key component of all projects/activities

Required Skills and Knowledge

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

Required skills

Required skills include:

- the ability to communicate high-level material using all modes of communication to all levels
- writing to the level of writing reports, policies and procedures
- numeracy to interpret and manipulate technical data

Required knowledge

The person must demonstrate understanding of specialised knowledge with depth in some areas. Required knowledge is to be limited to that which is sufficient to perform particular risk management functions. Competence includes the ability to apply and explain:

- AS/NZS ISO 31000:2009 Risk Management - Principles and Guidelines
- relevant legislation from all levels of government that effects business operation, especially in regard to WHS and environmental issues, equal employment opportunity (EEO), industrial relations and anti-discrimination
- the legal implications of deeming identified risks as acceptable
- strategic, tactical and operational plans of the organisation
- legal requirements for operating the business relevant to the area of responsibility
- relevant awards and industrial agreements
- workplace standards for WHS and environmental management
- internal or external audit methods
- focus group processes
- risk analysis processes

- investigation reports
- review of data, such as risk and incident reports, maintenance records and production records

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 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:

- develop, implement and evaluate the development of plans to eliminate, isolate or protect people (and/or equipment) in the event of a potential negative event occurring.

The emphasis should be on the ability to avoid/eliminate critical incidents rather than on recovery from a disaster.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the workplace, incidents on similar plants around the world, hazard analysis activities (e.g. HAZOP) and similar sources.

Context of and specific resources for assessment

Assessment will occur in an industrial site/plant and will be undertaken in a work-like environment.

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 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.

Method of assessment

Competence in this unit may be assessed:

- on an appropriate, industrial plant/site
- in a situation allowing 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 required 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.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the organisation and consistent with workplace systems or procedures.

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.

Context

Risk management is defined as coordinated activities to direct and control an organisation with regard to risk. The risk management plan should specify the approach, the management components and resources to be applied to the management of risk.

External specialist assistance

External specialist assistance may include but is not

limited to any group or individual in the community who has the expertise to assist the organisation to deal with any event/incident which may occur.

Risk

Risk is the effect of uncertainty on objectives. Risk may include but is not limited to:

- injury or disease
- environmental factors
- product failure
- financial/economic loss/failure
- damage to property/plant/equipment
- industrial disputes
- professional incompetence
- natural disasters
- security failure (including criminal or terrorist activities)
- equipment/system failures
- political events

Appropriate options for treating risks

Appropriate options for treating risks may include but are not limited to:

- compatibility with organisation policy
- feasibility of implementing
- validity of proposed treatment

Legislation

Legislation, codes and national standards relevant to the workplace may include:

- award and organisation agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to WHS, environmental issues, equal employment opportunity (EEO), industrial relations and anti-discrimination
- relevant industry codes of practice

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

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an

apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Not applicable.

MSAPMOHS601A Establish workplace OHS management system

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit covers the establishment and maintenance of the OHS management system (OHSMS) at the senior management level, in order to meet legislative requirements and to ensure that the workplace is, so far as is practicable, safe and without risks to the health of employees.

Application of the Unit

Application of this unit

This competency applies to managers and senior technicians who have an OHS responsibility. It typically applies when an OHSMS is being established, but could be used for a complete review of an existing OHSMS.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has the prerequisite of *MSAOHS503A Maintain the workplace OHS management system*.

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 needs of the OHSMS	1.1 Analyse the workplace to identify needs and workplace factors that may impact on the design of the OHSMS. 1.2 Clarify OHS legal obligations in relation to the specific workplace. 1.3 Review relevant standards relating to OHSMS. 1.4 Identify links with other functional areas and management systems. 1.5 Seek input from stakeholders on the design of the OHSMS.
2. Establish the framework for the OHSMS	2.1 Ensure OHS responsibilities and duties are documented and accountability processes are in place. 2.2 Identify and source financial and human resources required for the operation of the OHSMS. 2.3 Establish or review OHS policies and procedures. 2.4 Ensure implications of any proposed changes to the workplace are identified and addressed. 2.5 Recognise limits of own professional expertise and consult OHS specialists as necessary.
3. Establish and maintain participative arrangements for the management of OHS.	3.1 Establish and maintain appropriate participative processes with employees and their representatives in accordance with relevant OHS legislation and industry standards. 3.2 Provide information on OHS to employees in a format that is readily accessible and understandable.

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.
	3.3 Promptly and effectively deal with and resolve issues raised through participation and consultation in accordance with procedures for issues resolution. 3.4 Provide information about the outcomes of participation and consultation in a manner accessible to employees.
4. Establish and maintain risk management processes	4.1 Establish or review procedures for hazard, incident and injury reporting and investigation. 4.2 Establish or review procedures for hazard identification, hazard analysis and risk assessment. 4.3 Establish or review hazard specific risk control measures currently in place to meet legal requirements and minimise risk as far as is practicable. 4.4 Establish or review procedures for on going control of identified hazards and monitoring of the effectiveness of controls.
5. Establish and maintain an OHS training program.	5.1 Conduct an OHS training needs assessment for the workgroup that takes account of legislative requirements, internal policies and procedures, skills of workgroup and risk control requirements. 5.2 Develop and implement an OHS training program to identify and fulfil employee's OHS training needs as a part of the organisation general training program. 5.3 Coordinate with relevant training experts as necessary.
6. Establish and maintain a system for OHS records.	6.1 Identify and address legal requirements for record keeping and reporting. 6.2 Identify and access sources of OHS information. 6.3 Take actions to ensure that records are accurately completed, collected and stored.
7. Implement OHS systems, strategies and plans	7.1 Determine OHS priorities in consultation with managers and taking account of participative arrangements in the workplace. 7.2 Develop plans for the implementation of OHS strategies. 7.3 Monitor and update plans for achievement as

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.
	required.

Required Skills and Knowledge

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

Knowledge and understanding of the workplace OHSMS and State OHS legislative requirements, regulations, codes of practice and relevant industry standards, sufficient to establish and maintain the OHSMS within the scope of their responsibilities and competencies.

In these industries which are characterised by high risk hazards, it is vital that the overarching legal responsibility of managers is recognised in relation to the establishment and implementation of the OHSMS, including ensuring the compliance of operators with established policies and procedures. The responsibility applies not only within the general OHS Acts and regulations, but also within the legislation and national and industry standards applying to hazardous substances, dangerous goods and major hazards.

Competence includes the ability to apply a working knowledge of:

- all relevant State/Territory OHS legislation particularly as it relates to the roles and responsibilities of employers and employees, including supervisors and contractors, requirements for information and consultation and processes and arrangements to meet these obligations, requirements for OHS record keeping and reporting and requirements for training and licensing
- elements of an OHSMS and principles and practices of effective OHS management and risk control, OHSMS requirements of other functional area and management systems including business planning, purchasing, maintenance, contractors, training
- barriers to implementation of OHS, including language and literacy, cultural diversity of workforce and workplace culture in relation to OHS
- codes of practice, relevant industry standards, workplace procedures and work instructions
- apply the hierarchy of control to develop risk control procedures.

Language, literacy and numeracy requirements

This unit requires the ability to communicate technical information at all levels and using all modes of communication.

Writing is required to the level of writing reports, policies and procedures.

Numeracy is required to interpret and manipulate technical data.

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.

Where the assessee does not currently possess evidence of competency in *MSAOHS503A Maintain the workplace OHS management system*, it may be co-assessed with this unit.

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

It is essential that the OHS issues and workgroup dynamics are understood together with the required OHS knowledge in order to frame and implement an OHSMS that is practical and relevant to the workplace. It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- develop appropriate documentation
- consult and negotiate to implement the policies and procedures
- apply a systematic process to planning and implementation.

Consistent performance should be demonstrated. For example, the required level includes a working knowledge of the OHSMS as it applies in the specific workplace. Look to see knowledge and understanding of:

- OHS responsibilities of all levels in the workplace
- the consultation processes, either general or specific to OHS
- training and assessment of training needs
- hazard identification and risk assessment
- implementation of risk control measures by applying the hierarchy of control
- the need for specific hazard policies and procedures
- new and relevant OHS information
- OHS record keeping
- the system/routine for maintenance of plant and equipment
- the system for purchasing of supplies and equipment
- OHS issue resolution processes.

These aspects are best assessed in the actual workplace and work group however they may also be assessed as a review process in a sample workgroup accessed for the purpose of the assessment supported by a range of scenarios/case studies.

Assessment method and context

Assessment will occur on an industrial site/plant and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- on an appropriate, industrial plant/site
- in a situation allowing 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 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 unit of competency describes OHS requirements applicable for those with managerial responsibilities for establishment and ongoing management of the occupational health and safety management system within the organisation. This may be as a worker or as an owner of a business.

The competency is to be exhibited within the area of managerial responsibility, which may be an entire organisation or department of an organisation. Roles and responsibilities will vary from organisation to organisation.

Competence is demonstrated in the context of an organisation where the OHS system with related policies, procedures and programs may or may not be established. Where the OHS system is established, the role will relate to the review of the OHSMS.

Workplace factors that may impact on the design of the OHSMS include:

- whether certification is required
- organisational structure
- management commitment
- management style and OHS knowledge and skills of managers
- workplace culture, including industrial relations and safety culture
- communication and consultation processes
- other management systems requiring interface or integration with the OHSMS
- resources available
- nature of hazards and level of risk
- staff profile, including language, literacy and numeracy, workplace ethnic and cultural diversity, special needs for employees.

Other functional areas and management systems may include:

- strategic planning
- purchasing, procurement and contracting
- logistics
- HR and personnel management, including payroll
- engineering and maintenance
- information and records management
- finance and auditing
- environmental management
- quality management.

Relevant standards relating to OHS may include:

- Australian standards
- standards developed by OHS authorities
- industry standards
- standards developed by commercial organizations.

Legal requirements for record keeping will include requirements under:

- hazardous substances and dangerous goods legislation, including requirements to keep registers
- OHS and environmental legislation to report serious incidents and injuries, keep records of risk assessments.

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.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours
- fire and explosion.

Problems

Typical process and product problems may include:

- incidents with a potential for serious injury
- fires and explosions
- chemical spills
- bomb scares.

OHS Information Sources

Sources of OHS information may be external and include:

- OHS legislation, codes of practice and Australian and International standards
- OHS regulators
- industry bodies
- internet sites, journals and newsletters

Internal sources of OHS information include:

- OHS policies and procedures
- manufacturer manuals
- risk assessments, JSAs, workplace inspections
- MSDSs and registers
- hazard and incident reports.
-

Unit Sector(s)

Not applicable.

MSAPMOPS100A Use equipment

Modification History

Release 2 – Minor clarification changes to application and range, and minor editorial corrections.

Unit Descriptor

This unit covers the use of any item of equipment which is operated with limited application of knowledge.

Application of the Unit

This unit applies to all persons who have the responsibility for using equipment where they are not required to have any significant understanding of the equipment or the process.

In a typical situation the operator may be using, for example, a packaged chilled water refrigeration unit to supply chilled water to the plant. The operator uses simple controls and responds to fault alarms built into the equipment. Even though the equipment may be very sophisticated (e.g. using high-speed compressors and computerised monitoring and control equipment) the operator interface is relatively simple. The operator is expected to simply regard this equipment as a black box – they may know what it does, but little detail on how it does it.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

Where greater levels of understanding and interaction are required, then the appropriate 200 series technical unit should be used.

This unit has been written to apply to fluids as well as solids and may be applied wherever 'black box' equipment is used.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

This unit has **no** prerequisites.

Employability Skills Information

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

1. Follow workplace procedures	1.1 Find out what is required for the job 1.2 Identify and follow appropriate procedures 1.3 Complete all reporting as required 1.4 Recognise and report anything unusual
2. Monitor and use the equipment/process	2.1 Turn the equipment on and off as required by procedure 2.2 Monitor equipment throughout the job using measurements, readings and senses as appropriate 2.3 Recognise deviations from standard/desired conditions 2.4 Take appropriate corrective action

Required Skills and Knowledge

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

Minimal knowledge of the equipment and procedures but sufficient to recognise abnormal operating conditions and alert the appropriate individuals.

Knowledge of organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- describe appropriate safety procedures concerning the operation of the equipment, procedures relating to the reporting of hazardous conditions, and appropriate shutdown procedures
- recognise a situation requiring action and take the action specified in the procedures, and report the situation as specified in the procedures.

Language, literacy and numeracy requirements

This unit has minimal literacy and numeracy requirements other than those required to start and stop the equipment and recognise common problems (e.g. reading gauges).

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:

- use the equipment for the specified purpose
- operate the equipment within the prescribed operating limits
- identify when the equipment is not operating as prescribed
- correctly monitor the equipment's operation
- report equipment malfunctions or problems according to procedures.

Consistent performance should be demonstrated. For example, look to see that:

- standard procedures are followed
- deviations from desired conditions are recognised
- action specified in the standard procedures is carried out
- work is carried out safely.

Assessment method and context

Assessment will occur on an appropriate item of equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- on a processing plant allowing for operation under all normal and a range of abnormal conditions
- in a situation allowing 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

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

Standards and codes

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 operators new to the job or operators at any level using equipment where significant understanding of the equipment or process is not required. It applies to any item of equipment which may be used in any sector. It may include:

- compressors (packaged plant)
- refrigeration (packaged plant)
- fans
- blowers
- portable generators
- air conditioning units

	• other equipment with similar operating requirements
Packaged plant	Packaged plant includes: • all items of equipment which come in a 'ready to use' form, and are often skid mounted, portable or designed for use by untrained and inexperienced people
Procedures	All operations are performed in accordance with procedures. Procedures mean all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.
Hazards	Typical hazards include: • rotating components • drive chains or belts • hot or cold equipment parts • dust, vibration, noise or fumes • oil spills • fuel leaks
Corrective action	Taking appropriate corrective action includes: • reporting to the appropriate people or such other specific actions which have been previously defined for specific occurrences
Variables	Key variables to be monitored include: • equipment production outputs • equipment operating conditions • operating temperatures and pressures

Unit Sector(s)

Not applicable.

MSAPMOPS102A Perform tasks to support production

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the performance of largely manual tasks that are performed in support of the production process working under close supervision. It applies to all sectors of the industry.

Application of the Unit

Application of this unit

This competency applies to operators who are not operating equipment but are making product and contributing to the production process. It might also apply to a more experienced operator working outside their field of expertise and under close supervision. This competency is typically performed by all operators working either independently or as part of a work team.

It includes:

- 'fetch and carry' type tasks
- making product under close supervision but not operating process equipment (see *MSAPMOPS100A Use equipment*), following safe working procedures and using personal protective 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. Perform general cleaning duties.	1.1 Clarify cleaning duties. 1.2 Select and use personal safety equipment, where needed, in accordance with organisation procedures. 1.3 Determine, prepare and mix appropriate cleaning equipment and chemicals/detergents for specific tasks. 1.4 Follow procedures for handling and storage of cleaning liquids in accordance with organisation or manufacturer specifications. 1.5 Clean as required.
2. Perform general duties and tasks.	2.1 Perform tasks as directed. 2.2 Ask questions of appropriate person to confirm unusual requirements. 2.3 Organise relevant equipment and tools and check to confirm good working condition.
3. Transfer, remove or supply materials/ product where required	3.1 Organise, confirm and record requests and tasks according to specified procedures. 3.2 Identify and organise appropriate equipment for transferring material where relevant.

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.
	3.3 Load and unload material using suitable aids. 3.4 Transfer/move material to the correct destination in a safe manner.
4. Complete documentation accurately.	4.1 Complete documentation for tasks, where relevant, accurately in accordance with required organisation procedures.

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.

Knowledge of organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Required knowledge and skills include:

- machine and equipment operation
- procedures to handle products and materials
- use of products and materials
- quality requirements
- relevant OHS legislation, codes of practice, policies and procedures
- maintenance planning and workplace procedure
- reporting procedures
- loading and unloading materials
- applying all relevant safety practices
- use and disposal of a range of chemical cleaning agents, sealants and lubricants, where required
- communicating effectively within the workplace
- interpreting and applying established procedures
- documenting and transferring information.

Language, literacy and numeracy requirements

This unit has minimal literacy and numeracy requirements other than those required to carry out the job (eg recognise labels and signs).

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:

- undertake basic production tasks
- handle material and products
- locate and transport materials and products
- clean equipment, machines and work environment
- document work and maintain records as required
- apply workplace health and safety policies in work operations.

Consistent performance should be demonstrated. For example, look to see that production standards are met consistently.

Assessment method and context

Assessment will occur in a work-like environment.

Competence in this unit may be assessed:

- on a processing plant allowing for operation under all normal and a range of abnormal conditions
- in a situation allowing 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 operators working either independently or as part of a work team.

Procedures

All operations are performed in accordance with procedures.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. These may include:

- original manufacturer instructions and guidelines for the use of any equipment
- relevant procedures relating to safe working practices prescribed for the equipment
- local OHS legislation and/or Regulations
- site specific instructions based on production requirements.

Tools and equipment

This competency includes use of equipment and tools such as:

- cleaning equipment
- detergents and other chemicals hand and power tools
- hand trolleys pallet trucks
- but not more complex equipment such as forklifts, overhead cranes, or front end loaders.

Loading and unloading aids

Loading and unloading aids include various types of equipment other than regulated load shifting equipment and must conform to materials handling requirements, safe work practices and manual handling techniques, and workplace procedures

Hazards

Typical hazards include:

- slips, trips and falls
- manual handling injuries
- dust, dirt and vapours
- cuts and abrasions
- lack of knowledge of machine operation.

Problems

'Simple problems' means 'apply defined solutions to a narrow range of previously specified problems'.

Typical process and product problems may include:

- difficult access to the work area
- awkward work spaces
- tool failures or breakages
- defective equipment
- incorrect or defective materials
- wrong quantities of materials.

Variables

Key variables to be monitored include:

- atmospheric conditions (weather)
- condition of the work area
- placement of products or materials used in the production process
- lighting
- types of aids to production being used.
-

Unit Sector(s)

Not applicable.

MSAPMOPS200A Operate equipment

Modification History

Release 2 – Minor clarifications to application and range, and minor editorial corrections.

Unit Descriptor

This unit covers the skills and knowledge needed to operate a plant item/unit of equipment and the resolving of routine problems in accordance with procedures. This competency is for units of equipment/plant items which are not otherwise covered in this Training Package and may be organisation specific.

Application of the Unit

This unit applies to a person who has the responsibility for undertaking the routine operation of an individual unit of equipment or a plant item. The key factors are operating to organisation requirements, meeting quality standards and other workplace requirements. The type of people to whom this unit may apply include (but are not limited to):

- plant operators.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator as appropriate.

This unit applies:

- typically to ‘outside’ or ‘field’ operators, but may also apply to
- ‘panel’ or ‘control room’ operators.

This unit requires a detailed knowledge about the unit being operated and some knowledge about related units and processes.

This unit has been written to apply to both fluid and solids processing units. It does not include the operation of any packaged unit which only requires operation as a ‘black box’ (regardless of its engineering complexity) which is covered by MSAPMOPS100A Use equipment.

If several units are combined to form a unit which must be operated as an integrated unit then please see PMAOPS300B Operate a production unit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

This unit has **no** prerequisites.

Employability Skills Information

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

1	Check work requirements	1.1	Identify work requirements from work 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	Ensure housekeeping is to requirements
		1.6	Identify hazards associated with the job and take appropriate action
		1.7	Perform other pre-operational checks in accordance with procedures
2	Start up item of equipment as required	2.1	Conduct pre-start checks
		2.2	Start up item of equipment
3	Operate equipment	3.1	Check equipment is operating within required limits

to procedures	3.2	Check product meets specifications and quality standards
	3.3	Ensure product is consistently ready for next duty/ operation as appropriate
	3.4	Maintain supply of material(s) as required
	3.5	Complete logs and records as required
	3.6	Collect and segregate scrap, trim and other materials as required
	3.7	Keep equipment and work area clean
	3.8	Pause equipment and perform emergency stop, as required
4 Respond to routine problems to 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 knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults.

Knowledge of the organisation's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Knowledge of and skills in the operation of the item of equipment and main components sufficient to consistently meet required specifications and standards, including:

- operation of equipment and components
- workflow sequences and materials demand
- reasons for checking process control panels and reporting readings which do not conform to the work instructions
- approved hazard control and safety procedures and the use of PPE in relation to handling materials and using equipment
- equipment operation and clean-up; potential effects of variations in raw materials and equipment operation in relation to quality of product
- waste management and importance of reusing non-conforming products wherever

possible

- correct selection and use of equipment, materials, processes and procedures
- monitor equipment operation and product quality
- identify factors which may affect product quality or production output and appropriate remedies
- distinguish between possible causes of routine faults, such as:
 - incorrect quantity of materials
 - contaminated materials/additives
 - equipment faults/damage
 - wrong raw materials/additives
 - machine failure.

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 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.

Assessment will occur on an industrial example of the equipment and will be undertaken in a work-like environment.

Critical aspects for It is essential that competence is demonstrated in the knowledge

assessment and evidence required to demonstrate competency in this unit

and skills defined in this unit. These may include the ability to:

- operating the plant unit
- following approved procedures
- take appropriate action to resolve faults or report faults to appropriate personnel
- explain and implement relevant emergency procedures.

Consistent performance should be demonstrated. For example, look to see that:

- production standards are met consistently
- upstream and downstream communication is timely and effective operating procedures and work instructions are read and interpreted correctly
- problems are identified and appropriate action is taken (i.e. the problem is fixed or reported)
- all safety procedures are followed.

Assessment method and context

Competence in this unit may be assessed:

- in an appropriate, industrial item of equipment requiring demonstration of operation start and stop procedures
- in a situation allowing 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

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

Standards and codes	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 operators working either independently or as part of a work team.
Procedures	All operations are performed in accordance with procedures. Procedures mean 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: • process equipment and its major components • hand tools used in the this process • material loading equipment used for loading of raw materials • relevant personal protective equipment
Hazards	Typical hazards include: • spills • dusts/vapours • slips trips and falls • temperature • hazardous substances • 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 process conditions • variations in materials or contamination of materials • equipment, tool, die or mould damage • routine product faults

- machine malfunction
- mould/tooling problems
- variations in materials and/or contamination of materials

Variables

Key variables to be monitored include:

- atmospheric conditions
- temperature (hot/cold) variations in equipment or product
- die/product tolerances
- system/operating pressure
- programming variables
- operator variability
- timing or product cycles

Product

Product includes anything produced by a process step and so includes intermediate products such as the product from one process step which then becomes the feed for another

Unit Sector(s)

Not applicable.

MSAPMOPS212A Use organisation computers or data systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the use of organisation computers or data systems in order to work effectively. The operator is familiar with the system, can locate and use the appropriate data and is able to accurately record data into the system as required. This competency covers the use of computer equipment and company software programs, including selecting the correct programs for use and identifying minor faults in equipment or software.

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 are required to store and retrieve data, and produce documents, spreadsheets relevant to operational or administrative functions within the organisation. It includes:

- inputting data to the systems as required
- locating and accessing data as required for production support/problem solving
- using data to support business objectives
- producing construction documents, reports and spreadsheets
- running system checks and virus scans manually if automated systems fail
- producing required documentation within the security limits imposed by the company.
-

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 applications of computer or data system for work role.	1.1 Identify data and information available from the system and its application to work role. 1.2 Identify data from work role which needs to be entered in the system.
2. Use the computer/data system.	2.1 Adjust work station equipment to meet ergonomic requirements and use appropriate posture. 2.2 Log-on according to procedures. 2.3 Navigate system as required. 2.4 Input data or make changes as required. 2.5 Check entered or edited data is correct. 2.6 Access required data/information. 2.7 Output data as required. 2.8 Use 'Help' as needed.
3. Save file and exit system.	3.1 Save and store data in appropriate directory or folder. 3.2 Close file and exit applications programs without loss of data.

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.
	3.3 Back-up data if required in accordance with procedures.
4. Respond to routine problems with the system	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.

Knowledge of organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes an understanding of the organisation data system to the level needed to use the system and recognise and resolve problems. In particular it includes the ability to:

- demonstrate the operation of and access to data from the system
- describe the scope and range of data required from the system, in order to support the solution of problems
- describe the nature of the scope and range of available data
- describe the causes and remedies of common problems such as those selected in the Range Statement
- describe principles of operation of the equipment and software, hazard policies and procedures, job procedures and work instructions
- explain the application of software in relation to work role.

Competence also includes the ability to isolate the causes of problems to a component of the organisation data system and to distinguish between causes of problems such as:

- incorrect or misleading data
- system software faults
- system equipment faults.

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

Numeracy is also required to the extent of requiring competence in essential mathematical functions including + - x and ÷.

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 ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The reasoning process behind the problem analysis and determining the required actions should be assessed.

Consistent performance should be demonstrated. For example, look to see that:

- in-plant computer programs are correctly utilised
- software problems are recognised and solved effectively and efficiently
- documents are completed to the standard required
- the operation and access to data from the system can be demonstrated
- data can be input and output from the system as required
- obvious problems in related to operation of the system are recognised and an appropriate contribution made to their solution.

Assessment method and context

Assessment will occur using industrial equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- on a processing plant allowing for operation under all normal and a range of abnormal conditions
- 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 unit of competency includes organisation computer and data systems. This may include systems which cover (select relevant items):

- Word and Excel documents
- safety, safety data and injury reporting
- orders, purchasing, stock levels and scheduling
- stock control, stores, warehousing and logistics
- materials hazards, labelling, materials identification, materials safety data sheets (MSDSs)
- batch data, schedules, production planning and operations planning
- product quality, statistical control, production trends and quality control
- maintenance, maintenance planning, procedures and spare parts.

The organisation systems will usually be computerised, but may include data sheets, paper or hard copy records, manuals and instructions.

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:

- computers - stand alone and/or networked
- mobile terminals and hand held devices
- printers
- mouse, keyboard
- facsimile equipment
- onboard terminals
- scanners
- bar coders.

Software applications may include:

- CC mail and email
- Internet or intranet
- word processing, database and spreadsheet programs
- company/process specific software
- word processing, database and spreadsheet programs.

Documents may include:

- work orders
- work instructions/standard operating procedures
- email or CC mail
- faxes
- memos
- tables
- standard letters
- standard reports.

Hazards

Typical hazards include:

- repetition strain injuries
- glare from monitor screens
- damages cables or connections
- strains or injuries moving computer equipment.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- software problems, such as unable to access file, find correct page or send CC mail, input data.

- loose or disconnected cables
- 'frozen' screens
- faulty monitors
- key board problems.

Variables

Key variables to be monitored include:

- types of hardware systems
- access and log on procedures
- types of software packages
- Internet/intranet systems
- types of data to be stored and retrieved.
-

Unit Sector(s)

Not applicable.

MSAPMOPS400A Optimise process/plant area

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the ability to optimise the process performance of a complete plant area. It includes ensuring that production systems comply with Health, Safety and Environment (HSE) requirements, that process, plant and equipment utilisation is planned and carried out, and that problems are solved to fully meet operational needs and ensure that production of finished goods meets customer requirements.

Application of the Unit

Application of this unit

This competency requires the application of detailed operational and process knowledge, including the principles of operation of equipment, and the chemistry and/or physics and/or biology/biochemistry of changes to materials occurring during processing. It embodies a significant breadth and depth of technical knowledge and process understanding.

Assessment of this competency should ensure that the applicant can apply this knowledge to a process, and should typically rely on the applicant undertaking, or leading, a significant process improvement project.

This competency is typically performed by a senior operator, team leader or frontline manager.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit **has** prerequisites of

- MSAPMSUP390A Use structured problem solving tools
-

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. Analyse and evaluate current plant, equipment and processes.	1.1 Compare actual process, plant and equipment performance with requirements and/or historical data/records and/or design performance. 1.2 Identify abnormal or sub-optimal process, plant and equipment performance. 1.3 Identify hazards associated with the plant and equipment. 1.4 Collect and evaluate product, materials and/or process records to determine possible causes for sub-optimal performance. 1.5 Use appropriate techniques to rank possible causes from most to least probable cause.
2. Develop plan for corrective and/or optimisation action.	2.1 Analyse cause(s) to determine appropriate corrective action. 2.2 Predict the impact of a change in one unit/area on other related plant units/areas. 2.3 Predict the impact of a change on health, safety and environmental performance 2.4 Develop measurable objectives and evaluate alternatives.

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.
	2.5 Identify requirements to implement change. 2.6 Consult with stakeholders regarding planned changes and impacts. 2.7 Develop optimisation plan taking account of hazards identified and HSE implications and communicate to appropriate personnel. 2.8 Evaluate optimisation action to determine measures of effectiveness.
3. Coordinate corrective and/ or optimisation action plan	3.1 Coordinate all appropriate unit areas and operations in order to rectify problem causes in process, plant and equipment performance. 3.2 Initiate and/or implement all required corrective/ optimisation actions. 3.3 Communicate corrective/optimisation outcomes to all relevant personnel. 3.4 Implement procedures/systems to eliminate possible future causes. 3.5 Record and maintain log of all relevant information.
4. Develop continuous improvement strategies.	4.1 Review sources of information to identify possible factors causing sub-optimal performance. 4.2 Identify options for removing or controlling the risk of sub-optimal performance. 4.3 Assess the adequacy of existing control and quality methods and systems. 4.4 Identify opportunities to continuously improve performance. 4.5 Develop recommendations for continual improvement of process, plant and equipment effectiveness. 4.6 Consult with appropriate personnel and implement continuous improvement strategies. 4.7 Document implementation of continuous improvement strategies.

Required Skills and Knowledge

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

Knowledge and understanding of the:

- equipment,
- processes
- systems

sufficient to

- identify hazards associated with the process
- recognise opportunities to improve and/or enhance the quality of performance of the plant.

This knowledge needs to include:

- the relevant technical theory of the plant area
- an in depth understanding across the entire plant area
- the organisation standard procedures and work instructions
- relevant regulatory requirements, including those related to OHS risk control as appropriate to process/plant area optimisation.

Competence includes the ability to:

- apply analytical skills which enable corrective or optimal conditions to prevail
- identify and control hazards by applying the hierarchy of control as part of the optimisation process
- interpret information and make appropriate process control decisions.

Competence includes the ability to distinguish between:

- optimum and marginal performance of the plant
- effective and marginal performance corrections and actions.

as is relevant to the practical operation of all major equipment/process/systems within the area.

Optimising process systems requires application of detailed operational and process knowledge to address issues such as:

- starting material quality
- yield maximisation
- throughput maximisation
- energy efficiency
- use of utilities
- labour utilisation
- overall cost
- efficient use of equipment
- reducing downtime
- minimisation of waste and rework
- improved workplace layout and workflow.

Language, literacy and numeracy requirements

This unit requires the ability to communicate at all levels about what may be complex technical matters. It also requires the ability to evaluate complex information and sort often conflicting information into *useful* and *distracting* and to rank/prioritise information.

Writing is required to the level of reading and interpreting technical information, developing and modifying plans and procedures and interpreting relevant regulatory requirements.

Numeracy is required to the level of analysing product/process performance data, interpreting process condition information and deriving useful information from technical brochures, papers and similar. Calculation will be required to assist this and to determine priorities for optimisation plans (ie benefit/cost or other quantitative criteria)

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.

Competence must be demonstrated in the ability to analyse and evaluate current production performance, and develop and implement plans to optimise process systems.

While the technician is expected to take a lead technical role, and to demonstrate competence as defined above, optimisation is rarely undertaken by an individual alone and liaison with all relevant stakeholders is an expected part of this competency.

Where the assessee does not currently possess evidence of competency in *MSASUP390A Use structured problem solving tools*, it may be coassessed with this unit.

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

It is essential that the equipment/process/system be understood in depth and that the importance of critical material properties/settings/readings is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

Consistent performance should be demonstrated. For example, look to see that:

- non-routine problems are recognised and defined
- hazards are identified and controlled by applying the hierarchy of control

- possible causes of complex problems are identified based on experience and the use of analytical techniques in solving the problem, including identifying variations and cause, separating single problems from multiple problems and the recognition of recurring problems
- fundamental cause of process or equipment faults is determined
- corrective/preventative actions are developed to avoid recurrence of the problem and optimise the condition of the process, plant and equipment
- product quality and uniformity are maintained.

Competence must be demonstrated in the operation of all ancillary equipment to the level required for this competency unit.

Competence also includes the ability to implement improvements within appropriate time constraints and in a manner relevant to the operation of the equipment, processes and systems.

Context of assessment

Competence in this unit may be assessed by:

- observation over time in a processing plant allowing for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.
- using a suitable simulation and/or a range of case studies/scenarios
- undertaking a specific project based in the plant
- a combination of these techniques.

Method of assessment

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 unit describes the work conducted by senior operators, team leaders or front line managers who optimise process systems as part of their work function. It includes all items of equipment and unit operations which form part of the production process of a complete area.

Typical problems will require the application of detailed operational and process knowledge over the entire production/manufacturing area, including the principles of operation of the equipment and the chemistry, physics, biology and/or biochemistry of the changes to materials occurring within that area.

All operations are performed in accordance with organisation procedures, licensing requirements, legislative requirements and industrial awards and agreements.

Procedures

All operations are performed in accordance with procedures. Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. These may include or have been prepared from/to comply with:

- industry codes of practice
- materials safety data sheets
- equipment manuals
- equipment start up, operation and shut down procedures
- calibration and maintenance schedules
- quality manuals and procedures
- organisation recording and reporting procedures
- production and laboratory schedules
- material, production and product specifications.

Data/records

Historical data/records may include:

- hazard logs
- incident reports
- maintenance records
- product non-conformance reports
- production records.

Implementing change

Requirements to implement change may include:

- changes to procedures

- training of operators
- equipment modifications
- ensuring all HSE requirements are addressed.

Relevant/appropriate personnel

Relevant/appropriate personnel may include:

- managers
- OHS representatives and OHS committee.

Relevant information

Relevant information logged to include:

- modifications to plant or equipment
- modifications to procedures or practices.

Sources of information

Sources of information may include:

- hazard logs
- incident reports
- maintenance records
- work practices
- procedures
- industry journals
- equipment supplier information
- industry best practice information.

Health, Safety and Environment (HSE)

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Not applicable.

MSAPMOPS401A Trial new process or product

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency typically applies to a technician in a plant who is taking a lead technical role in the trialling of a new product or the trialling of a new or significantly altered process. This competency does not apply to minor modifications to existing products or processes.

Similarly it does not apply to a technician or operator taking part in such trials, and/or who is following directions set by the technician, chemist, engineer, supervisor or manager.

The technician is expected to be a technical expert in that part of the plant/process where the trial is being conducted.

Application of the Unit

Application of this unit

The technician would be expected to operate and control all equipment required for the trial. Generally the technician would be part of a team during the trial, and would usually be working in conjunction with a process/product development expert such as a chemist or engineer. The technician is often the most technically competent member of an operational team. As such they may not have the 'hands on' role of operating items of equipment, but they are expected to have the competence to direct the operation of equipment as appropriate throughout the trial. At all times they would be liaising and cooperating with other members of the team.

Trialling refers to the scale-up and other development steps required to take a new product or process from its design/laboratory trials to full commercial operation on a plant. Trialling may be done on a pilot plant where available and/or on a full scale plant.

The technician would:

- identify and rectify operational problems within their scope
- analyse the trial, both while it is occurring and after completion, and suggest improvements
- be alert for indications of developing problems and take required action to ensure the trial remains safe to people, the environment and the plant.
-

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. Contribute to the selection of equipment/process conditions.	1.1 Liaise with appropriate technical expert(s). 1.2 Interpret properties of materials and desired product characteristics. 1.3 Interpret technical specifications/drawings of plant requirements. 1.4 Recommend equipment/ancillary equipment appropriate for the materials, products and conditions. 1.5 Recommend process conditions appropriate for the

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.
	equipment, materials and product characteristics. 1.6 Recommend feed rates/order/condition appropriate to the process conditions, equipment, materials and product characteristics. 1.7 Ensure hazard identification and analysis procedures are completed, including consultation with stakeholders, and findings included in plan. 1.8 Ensure recommendations meet the identified need.
2. Prepare for trials.	2.1 Determine the availability of resources required such as materials, equipment, people and skills. 2.2 Estimate time required for trial. 2.3 Liaise with relevant stakeholders. 2.4 Schedule trial at a convenient time. 2.5 Develop documentation for the trial. 2.6 Identify potential hazards and required hazard control procedures by applying the hierarchy of control. 2.7 Determine clearance requirements and special safety and storage requirements. 2.8 Verify decisions with appropriate experts/stakeholders. 2.9 Ensure people with adequate skills are available for the trial.
3. Conduct test runs/trials	3.1 Ensure hazard controls are implemented prior to commencement. 3.2 Run trials. 3.3 Maintain communication with all relevant people. 3.4 Closely monitor critical parameters. 3.5 Recognise actual and potential problems. 3.6 Make adjustments to process conditions as required during trial. 3.7 Sample and test product as required. 3.8 Record and report performance data. 3.9 Ensure all materials, products and waste are handled correctly. 3.10 Leave plant in a condition suitable for routine production to recommence.

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.
4. Evaluate results and identify modifications.	4.1 Interpret data from trial. 4.2 Identify factors which might be related to low rates or low charge amounts. 4.3 Recommend modifications and improvements required. 4.4 Develop and check standard operating procedure. 4.5 Complete documentation and report to appropriate personnel. 4.6 Ensure all relevant staff have required skill levels for the introduction of the new process.

Required Skills and Knowledge

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

Competence includes an understanding of the plant systems and all integral equipment involved in the trial to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the plant and describe the function of each
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- state the major design features of plant equipment, plant conditions and variables and the impact of these on the properties of materials passing through them
- describe the causes and remedies of common problems such as those selected in the Range Statement
- apply the hierarchy of control to minimise the risk of hazards identified
- describe methods of changing rate and the advantages and disadvantages of each
- describe methods of controlling other process variables and the advantages and disadvantages of each.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the plant system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- process material variations
- instrument failure/wrong reading
- electrical failure

- mechanical failure
- operational problem.

Language, literacy and numeracy requirements

This unit requires the ability to communicate and liaise with people at a range of levels about technical matters.

Reading is required to the level of interpreting technical specifications, manuals and procedures; and writing technical documentation such as specifications and procedures required for the trial.

Numeracy is required to the level of interpreting technical specifications and test results, analysing process data and determining required variations in process variables.

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

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.

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Critical aspects

It is essential that competence is demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. For example, look to see that:

- hazards are identified and controlled
- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate and timely action is taken to ensure the safety and success of the trial
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context and method of assessment

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what if' scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Competence in this unit may be assessed:

- using a pilot plant or a production plant as appropriate
- using a range of scenarios/case studies and 'what ifs' as the stimulus with a walk-through forming part of the response
- using a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources
- 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 unit includes all items of equipment and unit operations which form part of the trial.

Liaison

Liaison with technical experts may (depending on trial requirements and company protocols) include one or more of:

- manufacturers
- chemists
- engineering personnel
- designers
- OHS advisors
- maintenance personnel
- potential customers.

Hazard analysis

Hazard analysis procedures may include:

- JSA/JHA (Job Safety Analysis/Job Hazard Analysis)
- hazard and operability (HAZOP) studies
- hazard analysis (HAZAN) studies
- other company specified procedures.

It is not expected that the candidate will be able to conduct technical hazard analysis procedures (such as HAZOP or HAZAN) but they should be able to interpret and use the outcomes of such analyses where relevant.

Hazards

Hazards may be determined from:

- materials safety data sheets (MSDSs)
- other relevant documentation such as hazard logs, incident reports
- company hazard identification procedures
- hazard analysis results
- standard operating procedures.

Waste handling

Waste handling may include:

- collection for re-use
- recycling
- disposal in accordance with health and environmental regulations.

Problems

Typical problems for the trial might include:

- mixing is poor
- materials do not behave as expected
- process/reaction does not proceed /proceeds too slowly
- process/reaction proceeds too quickly/runs away
- yield is low
- quality is out of specification
- process is unstable

- instrumentation is not sufficiently sensitive/too sensitive
- variable catalyst activity
- surging flow/pressure.

Health, Safety and Environment (HSE)

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Procedures

All operations are performed in accordance with procedures.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Unit Sector(s)

Not applicable.

MSAPMOPS404A Co-ordinate maintenance

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit applies to employees who coordinate maintenance of a manufacturing facility. It applies to all sectors of the industry.

This competency is typically performed by experienced technicians, supervisors, maintenance coordinators or team leaders, working either independently or as part of a team.

Application of the Unit

Application of this unit

This competency applies to supervisors and technicians who are required to apply knowledge of equipment operating principles, service requirements and workplace production operations to the coordination of maintenance activities. The key factors are the coordination of maintenance activities to meet the objectives of restoring the plant/equipment condition, consistent with production requirements.

The technician will:

- identify and plan maintenance work consistent with production requirements
- interpret data and information on equipment
- develop and monitor workplans for the maintenance activities
- organise materials, consumables and personnel to meet the maintenance objectives
- check tools, equipment, materials and output for conformity to job requirements
- 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. Plan maintenance.	1.1 Develop work plans for scheduled routine maintenance activities. 1.2 Develop maintenance plans for unscheduled maintenance activities. 1.3 Source maintenance providers (internal/external). 1.4 Develop costings for maintenance work. 1.5 Implement measures to control identified hazards in line with procedures and duty of care. 1.6 Document and record required production interruptions, processes and procedures. 1.7 Obtain clearances for the maintenance work.
2. Organise maintenance.	2.1 Schedule maintenance activities, with reference to production requirements and availability of resources. 2.2 Review available maintenance expertise and arrange appropriate training and assessment where necessary.

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.
	2.3 Obtain approvals for maintenance schedule as necessary to coordinate with production requirements.
3. Assemble maintenance requirements.	3.1 Determine resources required (equipment, personnel and consumables) to meet maintenance schedule. 3.2 Locate and coordinate supply of consumables, equipment and expertise to meet maintenance schedule. 3.3 Purchase equipment, consumables and expertise as required.
4. Complete maintenance.	4.1 Complete maintenance schedule. 4.2 Make appropriate readings, measurements and recordings and compare to equipment, product and other relevant specifications. 4.3 Identify areas requiring further testing and recommend appropriate procedures to supervisory staff. 4.4 Make appropriate adjustments to the maintenance schedule. 4.5 Complete records as required, noting areas where changes to equipment operation or routine maintenance are required.

Required Skills and Knowledge

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

Application of knowledge and understanding of equipment operation, planning and maintenance practices sufficient to plan for maintenance requirements in standard and non-standard situations and then determine appropriate action which is consistent with operation guidelines is required.

Knowledge of the enterprise's 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 process. Application of approved hazard control, safety procedures and the use of PPE in relation to handling materials, equipment operation and clean up.

Knowledge as a basis for solving processing and material problems, including:

- characteristics and capabilities of equipment, materials and processes used
- functions and troubleshooting of internal components and their problems
- routine and non-routine causes of equipment failures and the service conditions which may increase maintenance
- urgency and timeliness factors in planning maintenance activities in relation to production requirements
- proactive, predictive, preventative and reactive maintenance principles
- implications of maintenance for production and work activities
- source requirements for maintenance
- safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup
- the hierarchy of control including engineering controls.

Competence also includes the ability to:

- identify factors in production schedules, time and resource requirements (including external sources) in scheduling maintenance activities
- schedule maintenance functions in the most timely and cost effective manner
- apply relevant agreements, codes of practice or other legislative requirements
- ensure workplace is safe for maintenance activities.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical manufacturer specifications, equipment procedures, production schedules and material labels as provided to coordinators.

Writing is required to the level of completing workplace reports and proposals.

Numeracy is also required, eg analysing statistical information/historical data in the form of tables and graphs

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 ability to:

- recognise potential situations requiring action
- implement appropriate action.

Consistent performance should be demonstrated. For example, look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- planned work sequences are logical and conform with production schedules and work rosters
- maintenance schedules for reactive, planned and proactive maintenance are coordinated based upon the most appropriate and cost effective method to ensure equipment reliability and optimum performance
- plans are initiated and monitored, with activities modified for variations in workplace contexts and the environment, until final resolution has occurred.

Assessment method and context

It is preferred that assessment takes place in an industrial work environment.

Competence in this unit may be assessed:

- on a processing plant allowing for operation under all normal and a range of abnormal conditions
- in a situation allowing the generation of evidence of the ability to recognise, anticipate and solve problems
- 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 manufacturing industry. It does not include maintenance which would require trade level skills. It is not intended that this competency would cover performing maintenance which is carried on in a workshop.

This may include:

- predictive and preventative operational maintenance
- proactive maintenance
- reactive maintenance.

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 tools specific for the task
- testing equipment
- measuring and aligning equipment
- computer equipment
- relevant personal protective equipment.

Hazards

Typical hazards to be considered, include:

- isolations of energy sources, motive power and process materials
- manual handling of machinery components and the need for lifting devices
- hot, cold or components containing dangerous materials
- external hazards (eg traffic into a maintenance area)

Problems

Respond to/rectify 'non-routine problems' means 'apply known solutions to a variety of predictable problems'.

Typical process and product problems which may require maintenance, include:

- equipment performance outside of specification or requirements
- equipment breakdown
- equipment wear and tear.

Variables

Key variables to be monitored include:

- relationship of maintenance plan to production requirements
- costs of maintenance
- availability of materials and services
- documentation and record keeping.

Data and Records

Typical information sources, observed data and plant records may include:

- plant data
- log sheets
- production schedules
- operational and performance reports
- physical aspects such as noise, smell, feel and pressure
- condition monitoring information
- planned maintenance schedules
- standard operating procedures
- manufacturer instructions, specifications and service manuals
- machine circuit diagrams for hydraulic/pneumatic and electrical/electronic circuits
- plant description manuals.
-

Unit Sector(s)

Not applicable.

MSAPMOPS405A Identify problems in fluid power system

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the recognition and diagnosis of control system problems in hydraulic/pneumatic control systems on process equipment. It includes the implementation of appropriate corrective action. It applies to all sectors of the industry.

This competency is typically performed by technicians working either independently or as part of a work team.

Application of the Unit

Application of this unit

This competency applies to operators who are required to apply knowledge of fluid power systems and components to the identification and isolation of faults in equipment. The key factors are the diagnosis and the recommendation of action to resolve routine and non-routine faults, in order to return the equipment to production.

The technician will:

- identify and plan scope of equipment checks
- check settings, adjustments and performance of equipment
- identify and isolate faults in equipment
- propose solutions and carry out solutions within scope of authority
- 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. Identify pneumatic/hydraulic control system problems.	1.1 Categorise the types of machine malfunctions due to fluid power faults. 1.2 Describe the effects on product quality of fluid power problems. 1.3 Isolate possible faulty components from a circuit diagram and knowledge of the function of each component.
2. Implement appropriate corrective action.	2.1 Examine other possible faults. 2.2 Shortlist possible fault causes. 2.3 Conduct investigations of machine, products or data to determine most likely fault cause(s). 2.4 Take appropriate action to ensure fault is rectified. 2.5 Follow up on action to ensure completion in an appropriate time frame. 2.6 Recheck after corrective action to ensure fault has been rectified.
3. Identify maintenance	3.1 Check manufacturer instructions to determine

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.
requirements.	recommended maintenance schedule. 3.2 Check fault and maintenance history to determine adequacy of current regime and special requirements. 3.3 Determine criticality of machine to production/business. 3.4 Develop maintenance schedule/requirements for machine. 3.5 Liaise with all relevant stakeholders to ensure schedule is appropriate. 3.6 Report outcome to appropriate personnel.
4. Identify pneumatic/hydraulic control system problems.	4.1 Categorise the types of machine malfunctions due to fluid power faults. 4.2 Describe the effects on product quality of fluid power problems. 4.3 Isolate possible faulty components from a circuit diagram and knowledge of the function of each component.
5. Implement appropriate corrective action.	5.1 Examine other possible faults. 5.2 Shortlist possible fault causes. 5.3 Conduct investigations of machine, products or data to determine most likely fault cause(s). 5.4 Take appropriate action to ensure fault is rectified. 5.5 Follow up on action to ensure completion in an appropriate time frame. 5.6 Recheck after corrective action to ensure fault has been rectified.

Required Skills and Knowledge

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

Knowledge and understanding of the process and the interaction of process conditions on product quality sufficient to recognise and analyse control system faults.

Knowledge of organisation procedures and policies along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Application of the knowledge of managing risks using the hierarchy of controls applied to the process. Application of approved hazard control, safety procedures, use of PPE in relation to handling materials, equipment operation and clean up.

Knowledge as a basis for solving hydraulic system problems, including:

- principles of hydraulics/pneumatics
- fluid power circuit diagrams
- principles of circuit components
- appropriate testing procedures and use of equipment for a range of equipment faults
- urgency and timeliness factors in planning maintenance activities in relation to production requirements
- collection, analysis and reporting of data.

Competence also includes the ability to:

- identify and select testing methods based on cost and time effectiveness
- conduct inspections, checks and tests on equipment as appropriate
- read and interpret circuit diagrams for mechanical, hydraulic, pneumatic and electrical/electronic operating systems
- use technical information and manufacturer information to locate relevant data
- interpret technical specifications and manufacturer instructions
- ensure workplace is safe for testing and maintenance of equipment
- identify hazards of the materials and process
- implement appropriate procedures for hazard control
- use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret technical specifications and manufacturer manuals.

Writing is required to the level of writing procedures and schedules. Basic numeracy is also required to allow the interpretation of machine and product data and the comparison of actual with desired readings.

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 ability to:

- recognise potential situations requiring action and then in implementing appropriate action.

Consistent performance should be demonstrated. For example, look to see that:

- machine reliability is high.

Assessment method and context

It is preferred that assessment takes place on industrial equipment in a work environment.

Competence in this unit may be assessed:

- on a processing plant allowing for operation under all normal, and a range of abnormal, conditions
- in a situation allowing the generation of evidence of the ability to recognise, anticipate and solve problems
- 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.

Additional resources might include the provision of equipment with known faults/problems to allow for assessment of the ability to identify problems.

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 all common equipment used in the manufacturing industry and should be able to be applied to all equipment using fluid power control systems.

This competency applies to all work environments and sectors within the manufacturing industry. It assumes an understanding of the operation of all relevant equipment and processes but does not necessarily require them to be used personally.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions, manufacturer information and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- pumps
- pressure controls
- DCVs (directional control valves)
- flow control actuators
- accumulators
- filters
- heat exchangers
- proportional, servo and cartridge valves.

Hazards

Typical hazards include:

- high pressures (hydraulic and pneumatic)
- hot surfaces
- hydraulic oil spills and leakage
- noise.

Problems

Respond to/rectify 'non-routine problems' means 'apply known solutions to a variety of predictable problems'.

Distinguish between causes of faults such as:

- control system failure
- process condition
- materials
- component types.

Typical process and product problems may include:

- loss of flow, power
- power failure
- oil leaks (internal and external)
- component malfunction
- poor maintenance procedures
- regular maintenance
- shutdown
- using accumulator as emergency source
- motor failure effect on cycle time
- pressure loss
- short shots
- loss of clamp pressure
- oil temperature.

Variables

Key variables to be monitored include:

- oil levels
- temperatures
- cavitation/aeration/noise
- cleanliness
- poor performance
- safety aspects.
-

Unit Sector(s)

Not applicable.

MSAPMOPS406A Identify problems in electronic control systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the recognition and diagnosis of control system problems in electrical/electronic control systems on process equipment. It includes the implementation of appropriate corrective action. It applies to all sectors of the industry.

This competency is typically performed by technicians working either independently or as part of a work team.

Application of the Unit

Application of this unit

This competency applies to operators who are required to apply knowledge of electronic control systems and components to the identification and isolation of faults in equipment. The key factors are the diagnosis and the recommendation of action to resolve routine and non-routine faults, in order to return the equipment to production.

The technician will:

- identify and plan scope of equipment checks
- check settings, adjustments and performance of equipment
- identify and isolate faults in equipment
- propose solutions and carry out solutions within scope of authority
- 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. Identify electrical/ electronic control system problems.	1.1 Categorise the types of machine malfunctions due to electrical/electronic faults. 1.2 Describe the effects on product quality of electrical/electronic problems. 1.3 Isolate possible faulty components from a circuit diagram and knowledge of the function of each component.
2. Implement appropriate corrective action.	2.1 Examine other possible faults. 2.2 Short list possible fault causes. 2.3 Conduct investigations of machine, products or data to determine most likely fault cause(s). 2.4 Take appropriate action to ensure fault is rectified. 2.5 Follow up on action to ensure completion in an appropriate time frame. 2.6 Recheck after corrective action to ensure fault has been rectified.
3. Identify maintenance	3.1 Check manufacturer instructions to determine

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.
requirements.	recommended maintenance schedule. 3.2 Check fault and maintenance history to determine adequacy of current regime and special requirements. 3.3 Determine criticality of machine to production/business. 3.4 Develop maintenance schedule/requirements for machine. 3.5 Liaise with all relevant stakeholders to ensure schedule is appropriate. 3.6 Report outcome to appropriate personnel.
4. Identify electronic control system problems.	4.1 Categorise the types of machine malfunctions due to electronic control system faults. 4.2 Describe the effects on product quality of electronic control system problems. 4.3 Isolate possible faulty components from a circuit diagram and knowledge of the function of each component.
5. Implement appropriate corrective action.	5.1 Examine other possible faults. 5.2 Shortlist possible fault causes. 5.3 Conduct investigations of machine, products or data to determine most likely fault cause(s). 5.4 Take appropriate action to ensure fault is rectified. 5.5 Follow up on action to ensure completion in an appropriate time frame. 5.6 Recheck after corrective action to ensure fault has been rectified.

Required Skills and Knowledge

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

Knowledge and understanding of the process and the interaction of process conditions on product quality sufficient to recognise and analyse control system faults.

Knowledge of organisation procedures and policies along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Application of the knowledge of managing risks using the hierarchy of controls applied to the process. Application of approved hazard control, safety procedures, use of PPE in relation to handling materials, equipment operation and clean up.

Knowledge as a basis for solving electronic control system problems, including:

- fundamentals of electricity and electronics
- electronic circuit diagrams
- principles of electronic circuit components
- principles of PLC programming, troubleshooting and diagnosis
- appropriate testing procedures and use of equipment for a range of equipment faults
- urgency and timeliness factors in planning maintenance activities in relation to production requirements
- collection, analysis and reporting of data.

Competence also includes the ability to:

- identify and select testing methods based on cost and time effectiveness
- conduct inspections, checks and tests on equipment as appropriate
- read and interpret circuit diagrams for mechanical, hydraulic, pneumatic and electrical/electronic operating systems
- use technical information and manufacturer information to locate relevant data
- interpret technical specifications and manufacturer instructions
- ensure workplace is safe for testing and maintenance of equipment
- identify hazards of the materials and process
- implement appropriate procedures for hazard control
- use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret technical specifications and manufacturer manuals.

Writing is required to the level of writing procedures and schedules. Basic numeracy is also required to allow the interpretation of machine and product data and the comparison of actual with desired readings.

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

It is preferred that assessment takes place on industrial equipment in a work environment.

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

It is essential that competence is demonstrated in the ability to:

- recognise potential situations requiring action and then in implementing appropriate action.

Consistent performance should be demonstrated. For example, look to see that:

- machine reliability is high.

Assessment method and context

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.

Competence in this unit may be assessed:

- on a processing plant allowing for operation under all normal and a range of abnormal conditions
- in a situation allowing the generation of evidence of the ability to recognise, anticipate and solve 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.

Additional resources might include the provision of equipment with known faults/problems to allow for assessment of the ability to identify problems.

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 all common equipment used in the manufacturing industry and should be able to be applied to all equipment using electrical/ electronic control systems.

This competency applies to all work environments and sectors within the manufacturing industry. It assumes an understanding of the operation of all relevant equipment and processes but does not necessarily require them to be used personally.

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:

- application and programming of PLC (programmable logic controls) and ancillaries
- application of solid-state control/switching units
- switches, relays and solenoids
- position and pressure transducers
- temperature controllers.

Hazards

Typical hazards include:

- electricity
- temperature from hot surfaces and equipment
- malfunctioning equipment
- test equipment.

Problems

Respond to/rectify 'non-routine problems' means 'apply known solutions to a variety of predictable problems'.

Typical process and product problems may include:

- loss of flow, power
- power failure
- component malfunction
- poor maintenance procedures
- regular maintenance
- shutdown

- motor failure effect on cycle time
- short shots
- loss of clamp pressure
- no power
- electronic/electrical faults
- analysis with PLC.

Variables

Key variables to be monitored include:

- temperatures
- cleanliness
- poor performance
- safety aspects.
-

Unit Sector(s)

Not applicable.

MSAPMPER200C Work in accordance with an issued permit

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This unit aims to ensure that people working under a permit to work understand the system, know the limitations of the permit under which they are working and comply with all the requirements of the permit. The people to whom this unit applies may be called 'permit recipients' or 'permit holders' by some organisations. Some organisations call 'permits' 'clearances' This unit covers the basic competency of working under a permit. Where entry to a confined space is required, then <i>MSAPMPER205B Enter confined space</i> is also required. The safety observer (standby person) competencies are covered by <i>MSAPMPER202A Observe permit work</i>. Atmospheric testing is covered by <i>MSAPMOHS217A Gas test atmospheres</i>. The issuing of permits is covered by <i>MSAPMPER300B Issue work permits</i>.

Application of the Unit

Application of the unit	This competency applies to persons who are required to conduct work activities under the authority of an issued permit to work and within the context and requirements of that permit. This typically applies to all work done by maintenance staff and contractors, and also to any other non-process work performed on the plant. It includes: • identifying the range and scope of work covered by the permit • checking that the right type of permit has been issued for the type of work • adequately preparing to undertake the work, including obtaining all necessary safety equipment and PPE • undertaking the work strictly in accordance with the provisions of the permit • maintaining correct housekeeping with permit activities • completing work in accordance with the permit requirements • querying or raising matters about the permit if the scope of work/nature of the tools to be used varies from that covered by the permit • handing back the permit in accordance with procedures and obtaining appropriate sign off as required.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units		

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. Apply for permit(s)	1.1. Confirm the scope and location of the work to be done 1.2. Identify the need for a work permit(s) for the work to be carried out. 1.3. Identify the type of work permit required. 1.4. Collate information required for the issue of the permit 1.5. Apply for the permit following the organisations requirements
2. Identify the scope of the permit.	2.1. Check that work to be done complies with the permit type. 2.2. Check that the scope and location of work comply with the

ELEMENT	PERFORMANCE CRITERIA
	permit issued 2.3. Check that the hazard controls specified on the permit are consistent with the hazard analysis 2.4. Check that preparations specified on the permit have been completed 2.5. Sign onto/receive the permit.
3. Prepare for permitted work.	3.1. Maintain safe working conditions and environment by using available isolation procedures, safety equipment and emergency procedures. 3.2. Monitor plant conditions and hazards to ensure work under the permit remains safe. 3.3. Ensure that appropriate safety equipment and clothing are selected and worn as required by the permit and relevant procedures. 3.4. Inspect work area to ensure safety and compliance with permit requirements and procedures.
4. Work in accordance with an issued permit.	4.1. Use required hazard reduction/control measures. 4.2. Comply with requirements of the permit including safety observer if required. 4.3. Display issued permit on work site as required 4.4. Ensure compliance with scope, location and timeframe specified in the permit or seek re-authorisation as required 4.5. Suspend job and make work site safe before leaving job. 4.6. Formally seek and receive authorised extensions to the permit when required. 4.7. Give end of day status report to permit issuer.
5. Complete permit(s) to work.	5.1. Obtain new permit(s) or have existing permit(s) revalidated before work is recommenced. 5.2. Check the work conducted against the issued permit(s) to ensure that all the nominated work requirements have been satisfied. 5.3. Monitor general housekeeping to ensure that the site has been left in a clean and safe condition. 5.4. Ensure personal lockouts/tag outs/isolations are removed in accordance with procedures 5.5. Communicate status of the work conducted and the results of the permit to relevant personnel. 5.6. Complete documentation as required and have permit signed off when job is completed.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

Competence includes the ability to:

- access and interpret information relevant to specific tasks (eg labels, MSDSs hazchem signs)
- identify changes to conditions which may lead to the permit being revoked before the job is completed
- describe and/or explain hazards associated with tasks covered by the permit, types of tests required for the issue of work permits - the types of tests to include, atmospheric/oxygen/breathability, flammability/explosivity, toxicity/TWA, temperature, humidity
- the impact of the regulatory framework and organisation procedures under which the permit operates upon the particular job(s) requiring the permit.

Language, literacy and numeracy requirements

- This unit may require the ability to read and correctly interpret complex P&ID's; speak clearly and unambiguously in English; and to explain, describe and verify sometimes complex needs and issues.
- Writing is required to the level of completing workplace forms.
- Numeracy is required to the level of being able to correctly differentiate between high and low pressures and temperatures, voltages or masses.

Required knowledge:

Knowledge and understanding of the relevant OHS and environmental requirements, in particular those relating to various situations requiring work permits, with an ability to implement the requirements in a manner that is relevant to the job. Knowledge of the organisation's standard procedures and work instructions and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Sufficient knowledge of all types of permits is required to ensure work is not carried out without the correct permit. This includes recognizing hot work and confined spaces.

Knowledge of regulatory frameworks should include:

- licence requirements for the job,
- company policy and procedures
- permit control systems

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should demonstrate competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Simulation may be required to allow for assessment of parts of this unit. 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

Competence must be demonstrated in the ability to distinguish between situations requiring the types of permit and to list the major requirements of each type of permit. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- provide reasons for a permit system
- recognise the importance of different work permits
- comply with permit conditions including the wearing of appropriate personal protective equipment (PPE)
- take appropriate action to resolve faults or report faults to appropriate personnel
- explain and implement incident response procedures.

Consistent performance should be demonstrated, e.g. look to see that:

- communications are timely and effective
- deviations from permit conditions are recognised, reported, corrected and re-authorization arranged
- actions specified in the permit/standard procedures are carried out
- all safety procedures are followed.

Context of and specific resources

A holistic approach should be taken to the assessment.

EVIDENCE GUIDE**for assessment**

Assessment will occur over a range of situations which may include disruptions to normal, smooth operation.

Competence in this unit may be assessed:

- on a plant/in the work place/a work situation
- by using a suitable simulation based on the actual plant and including walk throughs of the relevant competency components and/or a range of case studies/scenarios and role plays
- by questioning and using 'what if' scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant
- through a combination of these techniques.

These aspects may be best assessed using a range of simulations/scenarios/case studies and 'what ifs' as the stimulus with a walk through forming part of the response. These assessment activities should cover a range of problems, including new or unusual situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

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. In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

While oral assessments may be appropriate there needs to be a written record for audit purposes.

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 which will be used to probe the reasoning behind the observable actions will also be required to the extent that they form part of the assessment method.

EVIDENCE GUIDE

Method of assessment	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.
Guidance information for assessment	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. 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 and the safety standard required.

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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version/version specified by the local regulatory authority must be used.
Context	This unit typically applies to all work done by maintenance staff and contractors, and also to any other non-process work performed on the plant. All work is to be conducted using the appropriate personal protective equipment. The types of work permits may include: • cold work/general permit to work • excavation • hot work • vehicle entry • minor repairs • working at heights • other special permits. Note that entry to a <u>confined space</u> is covered by <i>MSAPMPER205C Enter confined space</i>. The Australian Standard (AS2865) definition given for

RANGE STATEMENT	
	confined space entry is used in this Training Package. All operations are performed in accordance with standard operating procedures (SOPs). Checks to ensure a workplace is safe may include: • process isolations complete • mechanical and electrical isolations in place • atmospheric testing complete and atmosphere safe. If it is not safe and cannot be made safe, then appropriate measures are implemented as per SOPs. • relevant personnel informed of work and agree that it is safe and appropriate to proceed.
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: • legislation/codes • OHS legislation, codes of practice and guidance material • EPA • National and Australian standards • licence and certification requirements • internal permit control system. • process isolations complete • mechanical and electrical isolations in place • atmospheric testing complete and atmosphere safe. If it is not safe and cannot be made safe, then appropriate measures are implemented as per SOPs. • relevant personnel informed of work and agree that it is safe and appropriate to proceed.
Information required for permit	Information required for a permit includes: • work description • tools to be used • process/methods of work/SOPs • MSDSs • JHA/JSA/SWMSs
Tools and equipment	This competency includes use of safety equipment and tools such as: • eye protection (eg goggles) • ear protection • gloves

RANGE STATEMENT	
	• clothing • respiratory protection • helmets • safety footwear.
Hazards	Typical hazards include: • heat, smoke, dust or other atmospheric hazards • sharp edges, protrusions or obstructions • limited head spaces or overhangs • equipment or product mass • slippery surfaces, spills or leaks • noise, rotational equipment or vibration.
Display issued permit	Display issued permit on work site means to have the permit on the worksite and displayed/ready to be shown as required by the site/job requirements and may include: • displaying it in a provided mounting • having it accessible in a folder which is on the work site • having it folded in overall pockets in a manner which allows it to be readily shown on request.
Problems	'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical problems may include: • provision of the wrong permit • incorrect information being supplied with the permit • errors being made in the understanding of permit data • failure to correctly correspond to the requirements of the permit • failure to seek clarification when anomalies occur.
Variables	Key variables to be monitored include: • sites under which permit activities must be applied • type of permit to be executed • types of tools and equipment to be employed • size of work team • scope and urgency of work.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector	

Competency field

Competency Field	

Co-requisite units

Co-requisite Units		

MSAPMPER201A Monitor and control work permits

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the monitoring of the operational conditions in which a permit to work has been issued, and the required activities and functions associated with the production/process of chemical, hydrocarbons, oil, and other process manufactured products. This role may be carried out by the standby person or other appropriately qualified persons.

While this competency carries with it high levels of responsibility the role is usually prescribed by the permit process and may be exercised by any competent operator.

Application of the Unit

Application of this unit

This competency applies to personnel who are required to monitor a work situation in which the activity is conducted under the auspices of a permit to work. During this activity the individual will monitor the work situation for conformance to the permit and will immediately intervene if the parameters of the permit are exceeded or work proceeds outside the boundaries set by the permit. It includes:

- identifying and understanding the requirements of the permit
- monitoring any changes in the conditions of work under the permit
- ensuring work sequences are followed as permitted by the permit
- constantly inspecting the site for changed work or site circumstances
- reporting any non-conformance with permit conditions
- withdrawing or causing work to cease outside permit conditions
- confirming conformance with permit conditions and reporting conclusion of activities.
-

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 and monitor permit conditions.	1.1 Identify permit requirements. 1.2 Monitor permit holder and conditions to ensure that the work being conducted conforms to the issued permit requirements. 1.3 Identify and communicate changes in the operating conditions or requirements of the permit to permit holders to ensure they are kept aware of any hazards.
2. Monitor work permit systems.	2.1 Control work activities to comply with the organisation or site work permit system and safety procedures. 2.2 Check and verify the permit holder's knowledge of the issued permit and its requirements before allowing any repair or maintenance work to be

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.
	undertaken on the production/process equipment. 2.3 Undertake site inspections to ensure that the work to be undertaken is in sequence and completed in a safe and coordinated manner. 2.4 Identify hazards, and confirm with those undertaking the permitted work that control measures, as defined in the permit are established.
3. Identify and action non-compliance.	3.1 Identify conditions of active permits. 3.2 Report and record incidents of non-compliance according to procedures. 3.3 Take corrective action upon incidences of non-compliance with permit conditions through the withdrawal or suspension of the issued permit.
4. Confirm compliance with permit.	4.1 Complete checklists in accordance with standard <u>procedures</u>. 4.2 Document and communicate findings to appropriate personnel.

Required Skills and Knowledge

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

Knowledge and understanding of permit requirements sufficient to distinguish between situations requiring permits and then implementing the appropriate corrective action where required.

Knowledge of the organisation standard procedures and work instructions and relevant regulatory requirements, along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Competence includes the ability to apply and/or explain:

- an awareness of hazards associated with the permit
- Australian Standard AS2865 - Safe working in a confined space and relevant legislation
- identification of container and goods coding and HAZCHEM markings
- production workflow sequences and requirements for working in confined spaces
- focus of operation of work systems and equipment

- application of relevant agreements, codes of practice and other legislative requirements
- hazards of the materials and process and appropriate hazard control procedures
- identification and correct use of equipment, processes and procedures
- planning own work including predicting consequences and identifying improvements; as is relevant to the practical completion of the job.

Demonstration of competence in this unit should include knowledge of the following as appropriate to the process:

- blank/blind lists and P&IDs
- tagging procedures
- isolation procedures
- incident response procedures, including evacuation
- gas types, toxicity and explosivity and limits of each
- oxygen levels
- area knowledge including plant and processes
- permit types and limitations
- product tolerances and specifications
- static electricity and cathodic protection
- environmental hazards
- hot work protective measures
- columns
- vessels
- fire fighting equipment
- blinds/blanks
- pumps
- compressors
- prime movers
- valves.

An understanding of alarm and communication systems is required.

The regulatory framework to include:

- OHS
- EPA
- OHS authorities and NOHSC
- licence and certification requirements
- company policy and permit control systems.

Language, literacy and numeracy requirements

This unit requires the ability to:

- read and correctly interpret complex P&IDs
- speak clearly and unambiguously in English
- explain, describe and verify sometimes complex needs and issues.

Writing is required to the level of completing workplace forms and producing reports.

Numeracy is required to the level of being able to correctly differentiate between high and low pressures and temperatures, voltages or masses.

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

Assessment will occur using industrial equipment and will be undertaken in a work like environment

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

Competence must be demonstrated in the ability to distinguish between situations requiring the major types of permit and to list the major requirements of each type of permit. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- provide reasons for a permit system
- recognise the importance of different work permits
- comply with permit conditions including the wearing of appropriate personal protective equipment (PPE)
- take appropriate action to resolve faults or report faults to appropriate personnel
- explain and implement incident response procedures.

Consistent performance should be demonstrated. For example, look to see that:

- communications are timely and effective
- deviations from permit conditions are recognised, reported, corrected and re-authorisation arranged
- action specified in the permit/standard procedures is carried out
- all safety procedures are followed.

Assessment method and context

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which may include disruptions to normal, smooth operation.

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.

Competence in this unit may be assessed:

- on an operating plant over an extended period
- by using a suitable simulation based on the actual plant and including walk throughs of the relevant competency components and/or a range of case studies/scenarios and role plays
- by questioning and using 'what if' scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant
- through a combination of these techniques.

These aspects may be best assessed using a range of simulations/scenarios/case studies and 'what ifs' as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new or unusual situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

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. In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

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 which will be used to probe the reasoning behind the observable actions 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 application of this unit is defined by the level and area of responsibility.

Legislative and site specific safety procedures and/or requirements, including in hazard identification, assessment and application of control measures, must be met.

Compliance is required with:

legislation/codes:

- OHS
- EPA
- OHS authorities and NOHSC
- licence and certification requirements
- other relevant standards
- workplace specific permit control system.

Monitor means continual personnel presence to observe conditions of the workplace and work practices to ensure compliance with permit conditions. This may include:

- supervision/monitoring of contractors
- verification of permits, licences, tests
- document control
- compliance with legislation/codes.

Corrective action may include:

- ceasing job
- leaving the job site safe if it is safe and practical to do so
- report reason for ceasing job and request new permit when safe.

Indicative functions include:

- supervision/monitoring of contractors
- verification of permits, licences, tests
- document control
- compliance with legislation/codes.

This unit may be applied to either an individual or team related context within the workplace.

Procedures

All operations are performed in accordance with procedures.

Procedures cover all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. These may include:

- legislation/codes
- OHS legislation, codes of practice and guidance material
- EPA
- National and Australian standards
- licence and certification requirements
- internal permit control system.
- process isolations complete
- mechanical and electrical isolations in place

- atmospheric testing complete and atmosphere safe. If it is not safe and cannot be made safe, then appropriate measures are implemented as per SOPs
- relevant personnel informed of work and agree that it is safe and appropriate to proceed.

Tools and equipment

This competency includes use of equipment and tools such as:

- danger tags and lockouts
- out of service tags
- blinds/blanks
- blind/blank list
- gas testers and monitors
- lights
- ladders
- cathodic protection bonds
- barricades
- signage
- communications equipment
- process and equipment drawings.

The types of work permits may include:

- evacuation
- clearance
- hot work
- vehicle entry
- confined space
- minor repairs
- working at heights
- other special permits.

Safety equipment may include:

- eye protection (eg goggles)
- ear protection
- gloves
- clothing
- respirators and masks
- helmets.

Hazards

Typical hazards include:

- heat, smoke, dust or other atmospheric hazards
- sharp edges, protrusions or obstructions
- limited head spaces or overhangs
- equipment or product mass
- slippery surfaces, spills or leaks

- noise, rotational equipment or vibration.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- provision of the wrong permit
- incorrect information being supplied with the permit
- errors being made in the understanding of permit data
- failure to correctly correspond to the requirements of the permit
- failure to seek clarification when anomalies occur.

Variables

Key variables to be monitored include:

- sites under which permit activities must be applied
- type of permit to be executed
- types of tools and equipment to be employed
- size of work team
- scope and urgency of work

Health, Safety and Environment (HSE)

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Not applicable.

MSAPMPER202A Observe permit work

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This competency covers the safety observer role for permits requiring a safety observer. It may be undertaken by a member of the work team or an operator may perform this role.

Application of the Unit

Application of the unit	This competency covers the knowledge and skills required for a safety observer (sometimes called a hole watcher or a fire watch). Safety observers can stop permit work, but do not have the authority to restart it. It includes: • understanding the permit system and the individual permit's requirements • observing work being performed • noting any change in conditions and taking required action.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units	

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 for the job	1.1. Check the permit(s) issues are appropriate and sufficient for the work to be done 1.2. Prepare a rescue/incident response plan in accordance with procedures 1.3. Check plan is workable within the approved job procedures and issued permit(s) 1.4. Request revision of job procedures and or permit(s) to ensure rescue/incident response plan is practical.
2. Control the permit site.	2.1. Interpret the hazard controls required by the permit(s) 2.2. Check all hazard controls are complied with all the time 2.3. Maintain constant communication with workers 2.4. Control entry to and exit from the work site in accordance with the requirements of the permit(s) 2.5. Monitor the environment of the work site and adjacent areas 2.6. Monitor scope and location of work as defined by the permit(s) 2.7. Withdraw permit(s) and shut down work site if conditions vary from those required by the permit.
3. Take appropriate action for potential incident.	3.1. Ensure all required first response equipment is in the location specified by the permit(s) and is in working condition 3.2. Ensure all required monitoring is carried out as required by permit(s) 3.3. Withdraw permit and shut down work site in the event of an alarm or monitoring failure 3.4. Raise the alarm in the event of an incident 3.5. Implement rescue/incident response plan as required by procedures.
4. Complete safety observer role.	4.1. Hand over to oncoming safety observer before leaving role 4.2. Complete all required documentation and reports

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

This competency includes the following skills:

- observation
- decision making
- communication
- leadership

Required knowledge:

Competence in this unit includes the following knowledge:

- hazards associated with the job and the plant
- hazard analysis and control
- HSE legislative requirements related to plant
- incident response procedures
- permit principles 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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should demonstrate competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may

EVIDENCE GUIDE

Critical aspects for assessment and evidence required to demonstrate competency in this unit Context of and specific resources for assessment Method of assessment Guidance information for assessment	also include the use of case studies/scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant. Competence must be demonstrated in the ability to specify the requirements and then select the best solution to meet the necessary and desirable requirements. Assessment will require access to a plant or workplace over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions. In all plants it may be appropriate to assess this unit concurrently with other relevant units. 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**

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.

Codes of practice/standards

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

RANGE STATEMENT

Context	This competency covers any work permits which requires a safety observer. Permits are called clearances by some organisations. Typical types of permit requiring a safety observer include: • excavation • hot work • confined space • other relevant permits. Requirements identified on the permit may include testing of atmospheric conditions, ventilation and control measures such as isolation, barriers, tag out/lockout signs, communications, incident response. A 'competent person' is a person who has, through a combination of training, education or experience, acquired knowledge and skills enabling that person to correctly perform a specified task. Safety structures and controls may include automatic plant shut down buttons, cords/lanyards, alarms, barriers, guards, earth leakage devices, tag out/lock out procedures, warning lights.
Incident response	The required incident response may include: • first response to fire • some initial rescues • first aid/CPR • other responses These responses are not included in this units of competency but are the subject of their own unit of competency.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector

Competency field

Competency Field

Co-requisite units

Co-requisite Units	MSAPMPER200C	Work in accordance with an issued permit

MSAPMPER205C Enter confined space

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This competency covers the entry to confined spaces, for maintenance, servicing of vessels or other necessary reasons. Work in/entry to confined spaces shall conform to relevant legislation and AS2865, or its authorised update or replacement.

Application of the Unit

Application of the unit	This competency applies to persons who are required to enter confined space, for maintenance purposes, for cleaning, inspection or other reasons. It is required by all persons who are required to enter a confined space, as defined by the standard AS2865, or its authorised update or replacement. This unit includes: • preparing to enter the confined space • checking the preparations against the permit conditions • entering the confined space. AS2865 requires reassessment 'at appropriate intervals'. The industry regards reassessment on a two to three year cycle as good practice. It is expected that all standby persons will also be competent to enter confined space. See <i>MSAPMPER202A Observe permit work</i> for the standby person competency. The issuing of confined space permits is covered by <i>MSAPMPER300B Issue work permits</i>. Some sites and situations will require competency in associated units as a site corequisite. Some of these possible units are identified in the Overview of Assessment. These additional units should be accessed and may be combined

	by the RTO as a skills set if appropriate.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units	<i>MSAPMPER200C</i>	<i>Work in accordance with an issued permit</i>

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. Assess confined space for entry	1.1. Confirm and verify the purpose of the required entry. 1.2. Identify and assess hazards within/around the confined space. 1.3. Check a risk assessment associated with entry of the confined space has been conducted and documented. 1.4. Identify and document relevant controls.

ELEMENT	PERFORMANCE CRITERIA
	1.5. Take appropriate steps to ensure confined space is ready for entry. 1.6. Check the incident/emergency response plan is appropriate to the job 1.7. Rehearse own role in an incident/emergency response 1.8. Confirm and verify that the conditions of the permit reflect the risk assessment 1.9. Check the confined space is ready for entry.
2. Use safety equipment and PPE	2.1. Secure work site 2.2. Select, fit and wear designated PPE. 2.3. Select, test and use required instruments and monitors. 2.4. Challenge test atmosphere/atmospheric monitoring instrument if required before entry. 2.5. Confirm test/monitoring results show entry is safe
3. Work in accordance with confined space requirements.	3.1. Enter confined space safely 3.2. Work in compliance with permit requirements. 3.3. Arrange re authorisation/reissue of permits as required. 3.4. Complete confined space working documentation. 3.5. Maintain communications with all relevant personnel. 3.6. Take appropriate action if there is a change in risk/work environment.
4. Conclude confined space operations in accordance with procedures.	4.1. Recover, clean, service and store equipment. 4.2. Complete required final documentation. 4.3. Report any issues.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

Competence includes the ability to:

- access and interpret information relevant to specific tasks (eg labels, MSDSs hazchem

REQUIRED SKILLS AND KNOWLEDGE

signs)

- access and apply hazard controls
- identify changes to conditions which may lead to the permit being revoked before the job is completed
- describe and/or explain hazards associated with tasks covered by the permit, types of tests required for the issue of work permits - the types of tests to include, atmospheric/oxygen/breathability, flammability/explosivity, toxicity/TWA, temperature, humidity
- interpret and respond to gas test/monitoring results/information.
- identify a change in work conditions, possible new hazards and so the required hazard controls and obtain revalidation of permit
- implement hazard controls

Language, literacy and numeracy requirements

This unit requires the ability to:

- read and correctly interpret required documentation relevant to the entry
- speak clearly and unambiguously in English
- explain, describe and verify sometimes complex needs and issues
- understand the permit requirements.

Writing is required to the level of completing workplace forms and producing any required reports.

Numeracy is required to the level of being able to correctly differentiate between high and low pressures and temperatures, voltages or masses and interpret gas test/monitoring results.

Required knowledge:

Knowledge and understanding of the relevant OHS and environmental requirements, in particular those relating to various situations requiring work permits, with an ability to implement the requirements in a manner that is relevant to the job. Knowledge of the organisation's standard procedures and work instructions and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Sufficient knowledge of all types of permits is required to ensure work is not carried out without the correct written authority.

Knowledge of regulatory frameworks should include:

- OHS
- EPA
- OHS authorities and ASCC/NOHSC/state CSE regulations
- licence requirements
- company/organisation policy and permit control systems

REQUIRED SKILLS AND KNOWLEDGE

- other relevant standards.

Knowledge of and the application to the job of relevant legislation and AS2865/2009, or its authorised update or replacement, is essential. Australian Standard HB 213-2003 Guidelines for Safe Working in Confined Spaces, or its relevant replacement, is also a useful reference.

Knowledge of the organisation's confined space procedures is required.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit may be undertaken as an individual unit or in combination with other relevant units. Other possible relevant units include:

- RIIRIS201A Conduct local risk control
- RIIOHS204A Work safely at heights
- MSAPMOHS200A Work safely
- MSAPMOHS216A Operate breathing apparatus
- MSAPMOHS217A Gas test atmospheres
- MSAPMPER200B Work in accordance with an issued permit
- MSAPMPER202A Observe permit work
- PUASAR005A Undertake confined space rescue.

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

Competence must be demonstrated in the ability to distinguish between situations requiring different permits and to list the major applications and scope of each type of permit.

The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

As working in a confined space is inherently hazardous it is essential that the worker be able to demonstrate:

- recognition of a confined space
- the ability to work within a confined space

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

- compliance with the permit conditions
- recognition and control of atmospheric hazards
- use of confined space entry and exit equipment relevant to the site/job
- selection, use and maintenance of appropriate PPE
- use of communication equipment and processes applicable to confined space work
- completion of documents and records relevant to confined space work
- understanding of and the ability to initiate incident/emergency response plan.

Consistent performance should be demonstrated. For example, look to see that:

- communications are timely and effective
- deviations from permit conditions are recognised, reported and corrected and the permit is re-authorised or re-issued by competent person
- actions specified in the permit/standard procedures are carried out
- all safety procedures are followed.

Competence in this unit should be determined by a practical demonstration of a confined space entry. This may be achieved:

- by using a suitable simulation based on an actual plant AND
- by questioning and using 'what if' scenarios

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.

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to a plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions which will be used to probe the reasoning behind the observable actions will also be required to the extent that they form

EVIDENCE GUIDE**Method of assessment**

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.

Guidance information for assessment

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 and the safety standard required.

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 italicized 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.

Codes of practice/ standards

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version/version specified by the local regulatory authority must be used.

Confined space

The Australian standard (AS2865-2009) definition given for confined space is used in this Training Package, i.e.:

'An enclosed or partially enclosed space that is not intended or designed primarily for human occupancy, within which there is a risk of one or more of the following:

- (a) An oxygen concentration outside the safe oxygen range.
- (b) A concentration of airborne contaminant that may cause impairment, loss of consciousness or asphyxiation.
- (c) A concentration of flammable airborne contaminant that may cause injury from fire or explosion.
- (d) Engulfment in a stored free-flowing solid or a rising level of liquid that may cause suffocation or drowning.'

Entry

Entry to a confined space is defined by AS2865 as:
'when a person's head or upper body is within the boundary of the

RANGE STATEMENT	
	confined space. NOTE: Inserting an arm for the purpose of atmospheric testing is not considered as entry to a confined space.'
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: • legislation/codes • OHS legislation, codes of practice and guidance material • EPA • National and Australian standards • licence and certification requirements where relevant • internal permit control system • process isolations complete • mechanical and electrical isolations in place • atmospheric testing complete and atmosphere safe or if not safe and cannot be made safe then appropriate measures are implemented as per procedures • relevant personnel informed of work and agree that it is safe and appropriate to proceed • communication protocols with particular reference to organisation confined space requirements.
Ready for entry	Checking the confined space is ready for entry includes checking: • isolations are complete and appropriate • isolation provide positive isolation • atmosphere is safe (or if necessary relevant measure are in place to ensure safe entry into an unsafe atmosphere) • safe entry and exit methods are in place • other items to ensure compliance with procedures, permits, relevant legislation and AS2865. Appropriate steps to be taken if the confined space is not ready for entry may include reporting deficiencies and refusing to enter the space.
Conditions of the permit	Conditions of the permit include all hazard controls. Permit conditions may require atmospheric testing/monitoring in which case MSAPMOHS217A Gas test atmospheres will also be required.

RANGE STATEMENT	
Secure work site	Secure work site includes selecting and erecting/deploying required: • protective equipment, • apparatus • signs • barriers • etc as defined in the confined space entry permit requirements, AS2865 and other relevant requirements.
Designated PPE	Designated PPE (personal protective clothing and equipment) may include: • eye protection (e.g. goggles) • ear protection • gloves • clothing • respiratory protection • helmets • safety footwear • lifelines and harnesses • personal monitors and alarms • other relevant PPE as defined in the confined space entry procedures and permit requirements
Required instruments and monitors	Required instruments and monitors include: • instruments used for pre entry testing appropriate to the hazards • continuous monitors appropriate for the hazards • other devices used to test the confined space atmosphere: as required by the permit conditions
Re-authorisation/reissue of permits	Re-authorisation/reissue of permits may be required when: • there is any change to work undertaken • the work situation changes • there is a gap in work continuity • the permit requires it • other site rules require it • other reasons
Confined space permit	The confined space permit should meet the requirements of AS2865 - 2009 or other appropriate standard

RANGE STATEMENT	
Working documentation	Working documentation includes: • entry/exit/re-entry logs • other documentation required by AS2865 (eg s2.9) • other documentation required by the permit(s) • other documentation required by the site etc.
Appropriate action if there is a change in risk	Appropriate action if there is a change in risk includes any or all of: • seeking revalidation of the permit • evacuating the confined space • instigating/undertaking testing • raising the alarm • initiating the emergency/incident response plan • other relevant action.
Final documentation	Final documentation includes: • signing off of permit • documentation related to equipment used • other required records.
Reporting of issues	Reporting of issues includes: • feedback re the work and methods of improving the work process • signs and symptoms of operational stress, • equipment malfunctions • wear and tear of equipment, tools etc • condition of safety/rescue equipment • observations of the condition of the confined space within the level of competence of the person making the report.
Hazards	Typical may hazards include: • heat, smoke, dust or other atmospheric hazards • sharp edges, protrusions or obstructions • limited head spaces or overhangs • equipment or product mass • slippery surfaces, spills or leaks • noise, rotational equipment or vibration • high/low oxygen content • hazardous atmospheres (eg combustible, toxic) • entrapment • engulfment • heat stress

RANGE STATEMENT	
	• claustrophobia • external hazards that may impact on the safety of those working in the confined space (eg exhaust fume, or other hazardous vapours, being drawn into the confined space by ventilation fans) • other hazards eg as identified in AS2865.
Variables	Key variables to be monitored include: • sites under which permit activities must be applied • type of permit(s) to be executed • types of tools and equipment to be employed • size of work team • scope and urgency of work • persons in the confined space/rotation of people in confined space • environmental conditions (eg weather).
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector	

Competency field

Competency Field	

Co-requisite units

Co-requisite Units	

MSAPMPER300C Issue work permits

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This competency unit addresses the need for personnel who issue work permits to understand the permit system, know the limitations of each permit and make decisions regarding the need for and correct use of each permit. This competency unit includes the issue of any and all permits. It applies to the issuing of permits covering a single plant or plant area such as might be an operators scope of responsibility.

Application of the Unit

Application of the unit	This competency applies to personnel who are required to issues appropriate permits to work to persons conducting a variety of activities in workplace environments in which hazards exist or specific procedures need to followed and monitored to protect the safety of personnel and the integrity of plant or process. It includes: • reviewing the conditions under which the work will be undertaken • examining the site to determining the hazards and safety requirements applicable to the site • ensuring the appropriate permit(s) is (are) selected depending on the organisations procedures • determining the appropriate conditions for the permit(s) • raising, authorising and issuing the necessary permit(s) • monitoring compliance with the permit conditions • reporting any indiscretions or violations of permit conditions and where necessary revoking permits • managing the permit process especially in shift hand overs or extensions to work activities • withdrawing and signing off work permits on completion of the work and verification that the requirements of the permit have been complied with.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units	<i>RIIRIS201A</i>	<i>Conduct local risk control</i>

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. Identify need for work permit	1.1. Understand work permit system. 1.2. Identify and confirm with appropriate personnel the need for work permit. 1.3. Identify the correct permit for each situation.
2. Prepare work site for authorised work	2.1. Undertake an inspection of the work site. 2.2. Identify OHS and environmental requirements. 2.3. Conduct hazard identification and risk assessment. 2.4. Ensure work site is prepared in accordance specified work permit conditions. 2.5. Check permit conditions and report to appropriate personnel. 2.6. Identify need for and carry out testing in accordance with

ELEMENT	PERFORMANCE CRITERIA
	standard operating procedures.
3. Raise and issue work permits	3.1.Ensure conditions are documented on permit. 3.2.Ensure appropriate testing carried out and results documented on permit. 3.3.Determine an appropriate validity period 3.4.Check that permit conditions are met (ie validate permit). 3.5.Complete and authorise permit. 3.6.Ensure recipient(s) is advised of and agrees to abide by the requirements of the permit(s). 3.7.Ensure recipient(s) signs permit(s).
4. Monitor work for compliance	4.1.Undertake regular site inspections. 4.2.Monitor conditions and work progress and respond appropriately to changing conditions and circumstances. 4.3.Ensure permit currency and revalidate as required. 4.4.Ensure permit is displayed in prominent position. 4.5.Identify and, act on incidences of non-compliance and report promptly to relevant personnel. 4.6.Report any issues which arise with regard to work under the permit in accordance with procedures.
5. Receive end of day report	5.1.Receive end of day report from permit recipients 5.2.Confirm job progress and status. 5.3.Revalidate/arrange for revalidation of permit as required 5.4.Confirm work area has been left safe 5.5.Handover ongoing permits and status of suspended permits to oncoming shift.
6. Close work permit	6.1.Inspect job status. 6.2.Check that work undertaken satisfies permit conditions. 6.3.Ensure that work site is ready for a safe return to working conditions. 6.4.Check required returns to work status have been completed. 6.5.Sign off documentation and close permit in accordance with standard operating procedures. 6.6.Communicate work site and process status to relevant personnel.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

Competence includes the ability to select, apply and/or explain:

- appropriate PPE
- Australian Standard AS2865 -Confined Space
- Australian Standard AS1674.1 Safety in welding and allied processes (covers all hotn work)
- types of permits and what they cover
- hazards associated with each type of permit
- permit control system
- hazards of the area for which permit is being issued
- hazards that may be created by the interactions of the permit, the process and the plant area
- identification of container and goods coding and HAZCHEM markings
- production workflow sequences
- focus of operation of work systems and equipment
- application of relevant agreements, codes of practice and other legislative requirements
- methods of hazard analysis
- hazards of the materials and process and appropriate hazard control procedures, including hierarchy of control
- identification and correct use of equipment, processes and procedures
- selecting appropriate tests and knowing what the tests are for
- conducting and interpreting tests for contaminant gases and other hazards
- testing - types of testing may include:
 - atmospheric, including explosivity, O₂
 - flammability
 - toxicity
 - temperature
 - humidity
 - combustibles' oxygen, enriched or reduced
- estimating ventilation required for making vessels safe (eg for confined space entry, hot work)y including applying the formula for factors such as:
 - space turnover rate,
 - number of turnovers
- challenging/checking performance of monitoring and testing equipment against a standard sample
- supervision/monitoring of contractors.

REQUIRED SKILLS AND KNOWLEDGE

Some sources of underpinning OHS knowledge include appropriate OHS and Dangerous Goods legislation, Australian Standards and Safework Australia, State or Territory codes such as:

- NOHSC:1010 - National Standard for Plant
- AS4024.1 Safeguarding of machinery - general principles
- NOHSC: 1003 National exposure standards for atmospheric contaminants in the occupational environment.

The regulatory framework to include:

- OHS
- EPA
- OHS authorities and Safework Australia
- licence and certification requirements
- company policy and permit control systems
- other relevant standards.

This unit requires the ability to:

- read and correctly interpret complex P&IDs
- speak clearly and unambiguously in English
- explain, describe and verify sometimes complex needs and issues.

Required knowledge:

Knowledge and understanding of the materials, equipment and process sufficient to recognise situations requiring different types of work permits and then implement the appropriate action.

Knowledge of the organisation's standard procedures and work instructions and relevant regulatory requirements under which permit systems operate, along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Knowledge of the relevant requirements under AS2865.

Writing is required to the level of completing workplace forms and producing reports.

Numeracy is required to the level of being able to correctly differentiate between high and low pressures and temperatures, voltages or masses.

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and

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Knowledge, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should demonstrate competence on actual plant and equipment in a work environment.

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

Competence must be demonstrated in the ability to distinguish between situations requiring the major types of permits and to list the major requirements of each type of permit.

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- correctly identify situations requiring work permits
- identify and apply legislative requirements, relevant standards and codes of practice (which may be incorporated in the organisation's procedures) to the issuing of work permits
- list the requirements of each type of permit
- plan own work process within workplace procedures and explain the reasons for the steps in the process.

Consistent performance should be demonstrated. For example, look to see that:

- correct permit issued
- hazards are identified and controlled in the permit by applying the hierarchy of control
- required personal protective equipment (PPE) is specified
- problems are anticipated
- problems are efficiently resolved.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new or unusual situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Context of and specific resources

Assessors must be satisfied that the person can

EVIDENCE GUIDE**for assessment**

consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge. A holistic approach should be taken to the assessment.

Competence in this unit may be assessed:

- by use of a suitable simulation and/or a range of case studies/scenarios. Simulations should be based on the actual plant and will include walk throughs of the relevant competency components
- through questioning and the use of "what if" scenarios both on the plant and off the plant.
- 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.

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.

Method of assessment

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.

Guidance information for assessment

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the

EVIDENCE GUIDE

work being performed and the safety standard required.

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.

Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version/version specified by the local regulatory authority must be used.
Context	This competency covers the issue of any and all work permits. Permits are called clearances by some organisations. The types of permit include: • cold work • excavation • vehicle entry • minor repairs • working at heights • hot work • confined space • electrical • increased hazard • other relevant permits. Requirements identified on the permit may include testing of atmospheric conditions, ventilation and control measures such as isolation, barriers, tag out/lockout signs, communications, incident response. A 'competent person' is a person who has, through a combination of training, education or experience, acquired knowledge and skills enabling that person to correctly perform a specified task. Safety structures and controls may include automatic plant shut down buttons, cords/lanyards, alarms, barriers, guards, earth leakage devices, tag out/lock out procedures, warning lights.
The work permit system	The work permit system includes: • types of permits

RANGE STATEMENT	
	• legislative/regulatory/standards framework • roles and responsibilities of parties under the permit system • equipment which can and cannot be used for types of permit • alternative ways of conducting a job
Confined space	The Australian standard (AS2865-2009) definition given for confined space is used in this Training Package, i.e.: 'An enclosed or partially enclosed space that is not intended or designed primarily for human occupancy, within which there is a risk of one or more of the following: (a) An oxygen concentration outside the safe oxygen range. (b) A concentration of airborne contaminant that may cause impairment, loss of consciousness or asphyxiation. (c) A concentration of flammable airborne contaminant that may cause injury from fire or explosion. (d) Engulfment in a stored free-flowing solid or a rising level of liquid that may cause suffocation or drowning.'
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: • OHS • EPA • OHS authorities and AASCC • Australian Standards • licence requirements • company policy and permit control systems • other relevant standards.
Preparation	Preparation of work site includes: • mechanical, electrical and other energy sources, and process isolations • de-energising all sources of energy/pressure • purging of lines • lock out/tag out procedures • blinding/blanking lines.
Tools and equipment	This competency includes use of equipment and tools such as: • writing instruments • computers and printers • calculators

RANGE STATEMENT	
	• testing equipment.
Hazards	Typical hazards include: • unsafe conditions developing through failure to conform with the provisions of the permit • injuries to personnel • equipment failures • releases of toxic or noxious substances.
Returns to work status	Returns to work status may include: • de-isolation • removal of lockouts/tag outs • removal of drain covers • etc.
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 process and product problems may include: • selection of the wrong permit • incorrect information being supplied with the permit • errors being made in the completion of permit data • failure to correctly correspond to the requirements of the permit • failure to seek clarification when anomalies occur.
Variables	Key variables to be monitored include: • types of permits being issued • permit issuing procedures • permit protocols for extended work activities beyond the end of shift • permit hand-over procedures.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector	

Competency field

Competency Field	

Co-requisite units

Co-requisite Units		

MSAPMPER400A Coordinate permit process

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This competency covers the issuing and auditing of any and all permits across multiple plant areas or an entire site. It is typically undertaken by a senior process technician. This may be a routine job, a role in part of a job or a temporary role in a shut down or similar.

Application of the Unit

Application of the unit	This competency covers both the issuing of permits directly and also the coordination of permits issued by others. It focuses on potential conflicts between work being undertaken as well as checking that the permit system is being used correctly. It includes: • coordinating permits and the permit system • plant preparations and isolations and the preparation system • live auditing of permit issuers, permit recipients/holders • auditing of permit paper trails • overseeing and checking test regimes • quality checking of risk assessment • coordinating the issue of additional hazard control resources

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units	MSAPMPER300C	Issue work permits

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. Assess planned work for conflicts.	1.1. Identify all planned work for a time period 1.2. Determine the scope and HSE impacts of each planned job 1.3. Confirm hazard analysis and controls for each planned job 1.4. Compare hazard profiles for each planned job 1.5. Identify conflicts between planned jobs 1.6. Negotiate a solution between conflicts 1.7. Communicate results of negotiations to relevant stakeholders.
2. Issue required permits.	2.1. List those jobs which will be allowed to proceed in the time period 2.2. Confirm hazard controls required for these jobs 2.3. Identify jobs which have impacts across plant areas 2.4. Ensure controls and communications are adequate 2.5. Issue/cause to be issued required permits 2.6. Report as required by procedures.
3. Audit live permits.	3.1. Audit plant preparations 3.2. Audit permit issuing process 3.3. Check appropriate controls have been specified 3.4. Audit handover/sign on process 3.5. Audit work in progress for conformance to permit conditions 3.6. Audit work completion and hand back/closing process 3.7. Audit deisolation and return to work preparations 3.8. Take immediate and appropriate action on any problems found 3.9. Report on audit as required by procedures.

ELEMENT	PERFORMANCE CRITERIA
4. Audit past permits.	4.1. Obtain relevant paper work 4.2. Check for conformance to procedures 4.3. Check for appropriateness of specified hazard controls 4.4. Identify any non-conformance 4.5. Identify systemic non-conformances 4.6. Take any immediate action which is appropriate 4.7. Report on audit as required by procedures.
5. Analyse audit findings.	5.1. Identify improvements to the permit system 5.2. Identify improvements to the implementation of the permit system 5.3. Suggest improvements to the permit system as appropriate 5.4. Suggests improvements to hazard analysis processes 5.5. Suggest improvements to the plant preparation/return to operations processes 5.6. Suggest improvements to hazard controls 5.7. Suggest training required as appropriate

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

This competency includes the following skills:

- analysis
- decision making
- communication
- prioritisation
- leadership
- negotiation
- problem solving

Required knowledge:

Competence in this unit includes the following knowledge:

- the operations of the plant and each major unit in it

REQUIRED SKILLS AND KNOWLEDGE

- hazards associated with all plant materials, processes and process conditions
- hazard analysis and control
- HSE legislative requirements related to plant
- plant preparation procedures
- auditing principles

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should demonstrate competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to specify the requirements and then select the best solution to meet the necessary and desirable requirements.

Context of and specific resources for

Assessment will require access to an operating plant over an extended period of time, or a suitable method

EVIDENCE GUIDE

assessment	of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with other relevant units.
Guidance information for assessment	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**

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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency covers the issue of any and all work permits. Permits are called clearances by some organisations. The types of permit include: • cold work • excavation • vehicle entry • minor repairs • working at heights • hot work • confined space • electrical • increased hazard • other relevant permits. Requirements identified on the permit may include testing of atmospheric conditions, ventilation and control measures such as isolation, barriers, tag

RANGE STATEMENT	
	out/lockout signs, communications, incident response. A 'competent person' is a person who has, through a combination of training, education or experience, acquired knowledge and skills enabling that person to correctly perform a specified task. Safety structures and controls may include automatic plant shut down buttons, cords/lanyards, alarms, barriers, guards, earth leakage devices, tag out/lock out procedures, warning lights.
Live permits	Live permits applies to work currently being done
Past permits	Past permits applies to any permit which has been handed back/closed.
Audit permits	Auditing of permits includes all of: • selecting an individual permit and following it through • spot checking any aspect of permits • intensively checking one aspect of the process with all permits on issue
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Unit Sector	

Competency field

Competency Field	

Co-requisite units

Co-requisite Units		

MSAPMSUP100A Apply workplace procedures

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the skills and knowledge required to complete own work activities.

Application of the Unit

Application of this unit

This competency is typically performed by an operator working independently or in a team.

It includes:

- an awareness and application of workplace procedures
- an introduction to the industry
- knowledge of the company and the employee's role within the organisation.
-

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 industry sector.	1.1 Identify the industry sector. 1.2 Recognise the major competitors in the industry and their products. 1.3 Identify career opportunities within the industry sector. 1.4 Explain the major external issues facing the industry.
2. Identify products and customers.	2.1 Identify company products. 2.2 Identify needs of external customers in line with organisation priorities. 2.3 Identify needs of internal customers. 2.4 Identify the role of quality processes in meeting product standards. 2.5 Identify your role in meeting customer requirements.
3. Recognise plant structure and processes.	3.1 Identify key production sites/areas. 3.2 Explain role of individual in organisational structure. 3.3 Describe the production process within own work area and relationship with other parts of the production process.
4. Identify workplace role and responsibilities.	4.1 Identify company objectives. 4.2 Identify organisational policies and guidelines in relation to job role. 4.3 Describe key responsibilities including OHS of own section/team and functional area. 4.4 Identify task requirements and work role.

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.
	4.5 Explain individual role in achieving section/team, plant and company objectives.
5. Follow workplace procedures.	5.1 Identify existing sources of work instructions relevant to job role. 5.2 Follow work instructions in undertaking tasks. 5.3 Follow work instructions for recording process. 5.4 Seek advice from relevant personnel in clarifying work instructions when appropriate.
6. Recognise quality requirements.	6.1 Identify instances of variation in quality from specifications or work instructions. 6.2 Identify basic quality concepts to work activities. 6.3 Follow organisation procedures for reporting and managing variations. 6.4 Report problems with materials/product quality to supervisors. 6.5 Explain organisation procedures for identifying and suggesting improvements to improve product quality. 6.6 Work within the organisation quality system.
7. Plan and organise a personal daily routine	7.1 Plan daily routine to take into account rosters, industrial agreements and workplace procedures. 7.2 See clarification of requirements of tasks when appropriate. 7.3 Agree achievable time and other performance measures. 7.4 Complete tasks and identify and report variations to plan.

Required Skills and Knowledge

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

Competence includes an understanding of the products and functions of the organisation and the employee's role in completing tasks to meet customer, company and section/function objectives.

Language, literacy and numeracy requirements

This unit requires the ability to read and understand information contained in typical workplace documents such as standard operating procedures, OHS requirements, and maintenance logs.

Writing is required to the level of completing workplace forms and records.

Basic numeracy is needed to the extent required by work instructions and 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.

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 relevant organisational policies, plans and procedures
- identify production processes relevant to work role
- identify work requirements and relevant workplace documents
- request advice, effectively question and follow instructions
- identify quality standards.

Consistent performance should be demonstrated. For example, look to see that:

- industry sector and major issues facing the industry are recognised
- main internal and external customers are identified
- role of individual and team/section is identified in terms of meeting company objectives (including safety objectives) and customer requirements
- relevant workplace policies and procedures are identified and followed
- tasks are performed in accordance with safety requirements/the quality system/workplace procedures
- appropriate documentation as defined by procedures is correctly completed.

Assessment method and context

Assessment will occur on-the-job or in a simulated workplace.

Competence in this unit may be assessed:

- in a situation allowing the generation of evidence of the ability to recognise and resolve 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.

It may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

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 is a general competency that is performed by all operators in all areas of operation.

In large plants with multiple processes, it may apply to just one process in a plant if those processes do not interact with each other.

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:

- organisation goals, objectives and targets
- business and performance plans
- access and equity principles and practice
- equal opportunity and anti-discrimination principles and practice
- OHS policies, procedures and programs
- quality and continuous improvement processes and standards
- workplace procedures
- ethical standards
- workplace agreements and awards
- unions and industry associations.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'.

Unit Sector(s)

Not applicable.

MSAPMSUP101A Clean workplace or equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers general housekeeping duties, as well as the cleaning of plant and equipment. This competency is typically demonstrated by all operators working either independently or as part of a work team.

Application of the Unit

Application of this unit

This competency applies to personnel who are required to keep the work area, plant and equipment clean and tidy. The key factors are the identification, scheduling and performance of housekeeping requirements. This may include:

- identifying the range and scope of work required
- checking if any type of permit has been issued for the work
- knowing site safety and housekeeping standards
- adequately preparing to undertake the work, including obtaining all necessary safety equipment and PPE
- scheduling housekeeping duties
- handling chemicals and solvents safely
- keeping assigned plant and equipment clean.
- undertaking the work strictly in accordance with the provisions of any permit
- completing work in accordance with requirements
- moving work and waste materials to designated locations
- querying or raising matters about the scope of work if it varies from that normally undertaken
- completing the work in accordance with procedures and obtaining appropriate sign off as required.
-

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 housekeeping requirements.	1.1 Explain and understand site safety and housekeeping standards. 1.2 Undertake housekeeping inspection in accordance with procedures/work instructions. 1.3 Identify and schedule housekeeping requirements as appropriate.
2. Perform general housekeeping duties.	2.1 Keep designated work areas clean to organisation specific standards. 2.2 Keep designated work areas clear of obstructions. 2.3 Handle and use chemicals and solvents as per the manufacturer guidelines and company specifications. 2.4 Ensure work area is ready for next user. 2.5 Remove work materials to designated locations.

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. Clean plant and equipment.	3.1 Keep assigned plant and equipment clean following established organisation procedures. 3.2 Perform specialised cleaning procedures as required. 3.3 Ensure that appropriate personal protective equipment is used as required.
4. Dispose of waste materials.	4.1 Correctly identify waste materials. 4.2 Remove waste materials to a designated location.

Required Skills and Knowledge

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

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine an appropriate action which is consistent with operating guidelines.

Knowledge of organisation standard procedures and work instructions and relevant regulatory requirements, along with the ability to implement them within appropriate time constraints and in a manner relevant to the operation of the process.

Competence includes the ability to:

- apply and describe:
- duty of care
- requirements for housekeeping process
- procedures for plant maintenance
- safe handling procedures
- the standard of cleanliness required.
- distinguish between:
- re-usable materials and waste
- routine and special cleaning needs.
- plan own work, including predicting consequences and identifying improvements
- use PPE
- safely handle products and materials
- read relevant safety information and apply safety precautions appropriate to the task/ relevant to the practical operation of the process.

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 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 recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

Consistent performance should be demonstrated. For example, look to see that:

- early warning signs for work areas in need of cleaning are recognised
- work areas are kept tidy and clean
- equipment and/or materials is/are neatly stored, in a safe manner, in the correct location at all times when not in use
- equipment is always tidy and safe when in use.

Assessment method and context

Assessment will occur using industrial equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- in the operation of all ancillary equipment to the level required for this competency unit
- 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 may vary between organisations depending upon a range of practices and procedures, with consideration given to plant configuration and 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:

- cleaning equipment and materials
- brooms
- shovels
- solvents
- waste containers
- safety equipment.

Hazards

Typical hazards include:

- materials or equipment obstructing work areas
- heat, smoke, dust or other atmospheric hazards
- sharp edges, protrusions or obstructions
- limited head spaces or overhangs
- equipment or product mass
- slippery surfaces, spills or leaks
- noise, rotational equipment or vibration

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'.

Typical process and product problems may include:

- correct equipment not immediately available
- safety issues associated with housekeeping and/or cleaning
- ensuring that process aids rather than interferes with production.

Variables

Key variables to be monitored include:

- housekeeping and/or cleaning methods and procedures
- the type of tools and equipment used in special situations
- the use of personal protective equipment.
- correct use of tools
- waste collection and disposal
- conformance with frequency and quality of organisational reporting requirements
-

Unit Sector(s)

Not applicable.

MSAPMSUP102A Communicate in the workplace

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit of competency covers receiving, relaying and recording written and oral messages and providing relevant information in response to requests, within time lines.

Application of the Unit

Application of this unit

This competency applies to operators who are required to receive, relay and record work related information as well as respond to information requests in the workplace.

The operator will:

- record received messages
- seek clarification, when necessary
- access needed information, as required
- relay the correct information to appropriate person/s.
-

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. Receive and relay messages	1.1 Confirm understanding of the message is correct. 1.2 Accurately record the message. 1.3 Relay message accurately to appropriate person or section within designated timelines.
2. Interpret messages.	2.1 Clarify message if necessary. 2.2 Take appropriate action.
3. Respond to information.	3.1 Acknowledge and understand the request for information. 3.2 Access information from appropriate sources. 3.3 Relay information to appropriate person or section.
4. Complete workplace forms.	4.1 Select appropriate form. 4.2 Assemble information required for form. 4.3 Complete form as required. 4.4 Submit form as required.

Required Skills and Knowledge

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

Knowledge and ability to implement organisation policies and procedures on workplace communication, including:

- types, purpose and importance of workplace documentation
- workplace codes, including numbers, symbols, signs, colours and other codes.

Competence also includes the ability to:

- listen attentively
- formulate questions to clarify work requirements or instructions
- establish effective workplace relationship with colleagues
- adapt communication to a range of social, cultural and ethnic backgrounds.

Language, literacy and numeracy requirements

This unit requires the ability to read and understand information contained in typical workplace documents such as standard operating procedures, material safety data sheets, job cards, maintenance logs. Everyday workplace language is used, including some technical terms and mathematical language.

Writing is required to the level of completing workplace forms and records. Types of text may include short sentences, symbols, codes, signs, sketches and may be conveyed in printed form or screen based.

Basic numeracy is needed to the extent required by work instructions and 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.

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.

In all cases it may be appropriate to assess this unit concurrently with relevant team work and communication units.

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:

- provide and assess all required information and that the information provided both verbally and in writing is completed in a clear and concise manner that is easily understood by others and in accordance with workplace requirements.
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that:

- all information is provided in an efficient, effective, courteous and timely manner.

Assessment method and context

Assessment will occur on-the-job or in a simulated workplace.

Competence in this unit may be assessed:

- by observation and questioning to indicate understanding
- in a situation allowing 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. 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.

Reasonable adjustment of assessment tasks will be undertaken as required.

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.

Procedures

All operations are performed in accordance with procedures. Procedures include:

- all relevant workplace procedures
- work instructions
- temporary instructions
- relevant industry and government codes and standards
- telephone protocol , including industry timelines in answering calls.

Messages

Messages includes the following as appropriate to workplace requirements:

- written
- oral
- electronic.

Tools and equipment

This competency includes use of equipment and tools such as:

- two way radio
- computer
- telephone.

Problems

Respond to routine problems means 'apply known solutions to a limited range of predictable problems'. Typical problems may include:

- missing/lost messages
- required information not available
- required equipment not available
- conflict of work priorities.

Appropriate action for non-routine problems may be reporting to designated person or other action specified in the procedures.

Unit Sector(s)

Not applicable.

MSAPMSUP106A Work in a team

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the organisation of team activities to fit in with the scheduling of work to meet operational guidelines.

Application of the Unit

Application of this unit

This competency is typically performed by people who work within a team structure with limited discretionary powers

The worker will:

- plan and organise activities in accordance with instructions
- use appropriate interpersonal skills to contribute to effective teamwork
- seek assistance from other team members where appropriate
- complete logs and reports.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Individual organisations may choose to add prerequisites and corequisites relevant to their processes.

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 activities.	1.1 Identify task requirements of the team. 1.2 Identify individual tasks that are part of the team requirement. 1.3 Prioritise team and individual activities as directed.
2. Organise daily work plan.	2.1 Break work activities down into small achievable components. 2.2 Record activities as required by procedures/work instructions. 2.3 Seek assistance from other team members when difficulties in achieving allocated tasks arise.
3. Participate in a team.	3.1 Use interpersonal skills appropriate to the effective teamwork of the shift/crew/section within the workplace. 3.2 Acknowledge information and feedback provided by other team members in work group. 3.3 Acknowledge team roles and support team members in achieving their role. 3.4 Practise teamwork within and between groups to contribute to the achievement of company work

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.
	standards.

Required Skills and Knowledge

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

Knowledge and understanding of organisation information systems, procedures and equipment sufficient to plan daily work activities in order to meet timelines.

Knowledge of organisation standard procedures and work instructions and relevant regulatory requirements, along with the ability to implement them within appropriate time constraints and in a manner relevant to the operation of the system.

Competence also includes the ability to:

- use effective communication techniques
- identify where teams fit into the organisational structure
- apply organisation quality and safety procedures
- complete required workplace documentation
- distinguish between urgent and non-urgent tasks.

Language, literacy and numeracy requirements

This unit requires the ability to read and understand typical product specifications, job sheets, procedures and work instructions, material labels and safety information as provided.

Writing is required to the level of completing workplace forms.

Basic numeracy is required to the extent required by work instructions and 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.

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 work activities and prioritise work in order to meet timelines, whilst interacting as a member of a group.

Consistent performance should be demonstrated. For example, look to see that:

- activities are planned in accordance with instructions
- willingness to participate as part of a team is demonstrated
- relevant procedures are accessed and utilised in completing activities
- timelines are adhered to
- assistance is sought from relevant personnel when difficulties arise.

Assessment method and context

Assessment will occur on-the-job or in a simulated workplace.

Competence in this unit may be assessed:

- by observation over time on a processing plant or in a manufacturing environment
- in a situation allowing 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 in the manufacturing industries.

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 PPE.

Hazards

Typical workplace hazards include:

- chemicals and hazardous materials
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in confined spaces, or in environments subjected to heat, noise, dust or vapours.

Problems

Respond to routine problems means 'apply known solutions to a limited range of predictable problems'. Typical problems include:

- required information/materials not available
- required tool/equipment not available
- conflict of work priorities
- interpersonal conflict within the team.

Appropriate action for non-routine problems may be reported to designated person or other action specified in the procedures.

Unit Sector(s)

Not applicable.

MSAPMSUP172A Identify and minimise environmental hazards

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the awareness of environmental issues and organisation environmental policies and procedures to minimise environmental threats.

Application of the Unit

Application of this unit

This competency is performed by all operators in all plants. It reflects the regulatory requirements and the industry's concern to operate in an environmentally friendly manner.

The operator will:

- identify activities/materials likely to be an environmental issue
- take the appropriate action on environmental issues as required.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Individual organisations may choose to add prerequisites and co-requisites relevant to their processes.

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 potential environmental threats.	1.1 Recognise the type and severity of environmental threat posed by the materials and processes used for own work. 1.2. Identify ways materials used may enter the environment. 1.3. Identify sensitive features of the local environment and their impact on work practice and procedures.
2. Identify workplace procedures and policies to minimise environmental threats.	2.1 Identify workplace policy for environmental protection. 2.2. Identify in relevant standard operating procedures environmental protection measures appropriate for work. 2.3. Explain contact procedures for personnel involved in environmental response teams. 2.4. Recognise abnormal or unacceptable emission levels.
3. Follow procedures to minimise environmental threats.	3.1 Implement environmental protection measures in relevant procedures. 3.2. Report abnormal emissions/environmental issues to appropriate personnel. 3.3. Apply containment procedures in accordance with SOPs where appropriate. 3.4. Implement approved waste management procedures and practices. 3.5. Follow approved safety procedures and use

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.
	personal protective equipment as specified in procedures.

Required Skills and Knowledge

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

Knowledge and understanding is required of organisation environment protection systems, procedures and equipment sufficient to for work activities.

Knowledge is required of organisation standard procedures and work instructions and relevant regulatory requirements, along with the ability to implement them within appropriate time constraints and in a manner relevant to the operation of the system.

Competence includes an awareness of:

- internal environmental control standards
- severity of environmental risks from materials and work processes used
- likely impact on the environment of materials and process.

Competency also includes an awareness of the local environment and environmental issues such as:

- sensitive waterways/wetlands
- flows from the plant to the environment (eg through sandy soil, local creek)
- particular environmental threats posed by materials and processes used and the work practices required to minimise these threats.

Also required is the ability to:

- communicate using in-plant reporting systems - verbal, electronic and written
- initiate first response to an environmental incident in accordance with SOPs
- use containment equipment
- use personal protective equipment
- use other required resources.

Language, literacy and numeracy requirements

This unit requires the ability to read and understand typical product specifications, job sheets, procedures and work instructions, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required to the extent required by work instructions and 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.

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 actual and potential environmental breaches as appropriate to the job level.

Consistent performance should be demonstrated. For example, look to see that:

- standard procedures are followed
- deviations from desired conditions are recognised
- action specified in the standard procedures is carried out
- the impact of work practices/actions on the environment is understood.

Assessment method and context

Assessment will occur using a simulation and will occur in a work like environment.

Competence in this unit may be assessed:

- by observation over time on a processing plant
- in a situation allowing 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 in the industries. Responses are restricted to a 'first response' approach, including the notifying of appropriate organisation personnel.

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:

- PPE
- spill kits.

Hazards

Typical workplace hazards include:

- chemicals and hazardous materials
- gases and liquids under pressure
- moving machinery
- materials handling.

Emissions/discharges

Typical emissions/discharges include:

- noise
- light
- odour
- gas
- smoke vapour
- liquid and solids
- particulates
- fumes.

Problems

Respond to routine problems means 'apply known solutions to a limited range of predictable problems'. Typical problems include:

- required information/materials not available
- required tool/equipment not available

Appropriate action for non-routine problems may be reported to designated person or other action specified in the procedures.

Unit Sector(s)

Not applicable.

MSAPMSUP200A Achieve work outcomes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

The competency covers the ability to identify and implement actions to achieve workplace targets and to suggest improvements. This unit applies to all employees who may work either individually or as part of a team.

This unit does not cover maximisation of process/equipment efficiencies undertaken as part of the normal work role, which is covered in the relevant unit of competency.

Application of the Unit

Application of this unit

This competency is typically performed by an operator, perhaps working as part of a team, in achieving required work outcomes of quality and productivity within the scope of their job. They would be liaising and cooperating with other members of the work place.

The operator will:

- understand the production process
- recognise production inefficiencies within their area
- participate in and implement ways of improving production efficiencies.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit of competency 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 raw material components and their application in production.	1.1 Outline the properties of materials/components used in the production process. 1.2 Describe or construct a flow chart of the production process relevant to the area/plant. 1.3 Outline parts of the production process where extra care and attention are required. 1.4 Identify the safety and environmental requirements for relevant materials and processes.
2. Identify production targets in work area.	2.1 Identify production targets for work area and work roles taking account of OHS requirements. 2.2 Identify techniques used to measure production performance against workplace targets/standards.
3. Recognise key areas effecting production efficiencies.	3.1 Explain importance of reducing wastage of resources. 3.2 Identify potential sources of wastage/production inefficiencies. 3.3 Outline possible approaches to minimise wastage/inefficiencies. 3.4 Demonstrate effective techniques to ensure wastage/

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.
	production minimisation within scope of job.
4. Implement actions to achieve production targets.	4.1 Identify the role of the individual and/or the team in achieving production targets. 4.2 Carry out required role to achieve production targets.
5. Participate in an improvement activity in accordance with organisation procedures.	5.1 Explain organisation procedures for identifying and suggesting improvements. 5.2 Explain the use of information in developing improvements related to work area. 5.3 Investigate a problem. 5.4 Suggest options for causes of problem. 5.5 Suggest options for improvement. 5.6 Discuss a proposed improvement with appropriate people.

Required Skills and Knowledge

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

Knowledge and understanding of the process, normal operating parameters and product quality to recognise non-standard situations. Knowledge of the relevant OHS and environmental requirements is required along with an ability to implement them in a manner which is relevant to determining the corrective action and provision of recommendations.

Thorough knowledge of organisation standard operating procedures is required. Some appreciation of business goals is required as a basis for decision-making and action.

Competence to include the ability to apply and explain sufficient for the identification and implementation of ways to maximise production efficiencies:

- relevant equipment and operational processes
- hazards associated with the process
- application of the hierarchy of control in controlling the hazards
- the safety implications of improving efficiencies
- organisation policies and procedures
- organisation goals, targets and measures
- organisation OHS, quality, and environmental requirements

- individual and team roles and responsibilities in achieving safety, quality and environmental targets
- principles of decision making strategies and techniques
- organisation information systems and data collation
- industry codes and standards.

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, e.g. to interpret quality data and graphs.

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

Consistent performance should be demonstrated. Critical aspects of competency include:

- hazards are identified and controlled
- production targets and measures are identified
- wastage and production inefficiencies for the functional area are identified
- work is conducted in a manner to minimise wastage/inefficiencies
- organisation procedures for identifying and suggesting improvements are followed
- effective participation in process improvement teams/activities is demonstrated.

Assessment method and context

Assessment will occur on-the-job or in a simulated workplace.

Competence in this unit may be assessed:

- in a situation allowing 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 will be used.

Context

This competency applies to all work environments and sectors within the industries.

This competency unit applies to a wide range of processes and equipment. In large plants with multiple processes, it may apply to more than one process if those processes interact with each other. It applies to all operators across all functions.

Properties of materials/components

Properties of materials/components includes:

- physical and chemical properties relevant to the process and the product
- hazardous properties.

Production targets/performance

Production targets/performance may include a range of factors where relevant to the job such as:

- volume
- quality

- cost.

Wastage

Wastage may include:

- overproduction.
- waiting
- transporting
- inappropriate processing
- unnecessary inventory
- unnecessary/excess motion
- defects (quality).

Sources of information

Sources of information may include:

- yearly, monthly, weekly and daily production targets
- business objectives and goals
- control charts, run charts and graphs
- organisation manuals and procedures
- equipment specifications.

Inefficiencies

Sources of process inefficiencies and wastage may include:

- equipment downtime
- spillages
- leaks
- contamination
- raw material quality
- utilities usage
- productivity issues
- incorrect work allocation/priorities/planning
- incorrect processes/procedures.

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:

- workplace forms and logs
- communication equipment for gathering and exchanging information such as telephones, two way radios, fax machines.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'.

Typical problems include:

- non-routine process and quality problems
- equipment selection, availability and failure
- teamwork and work allocation problems
- safety and emergency situations and incidents.
-

Unit Sector(s)

Not applicable.

MSAPMSUP201A Receive or despatch goods

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the handling of materials by an operator as an adjunct to the job of making product. It applies to a limited range of materials. It is NOT intended to be an alternative warehousing competency.

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 receive, process despatch orders, despatch products/materials and maintain records. The key factors are correctly identifying and selecting the goods to be despatched and ensuring they are despatched to the correct location.

It includes:

- checking order requests/consignment note documentation for products/materials to be despatched
- identifying and selecting the correct products/materials
- organising products/materials to be moved into the right place by the right time, using the appropriate handling equipment
- preparing products/materials for despatch
- completing and checking all documentation
- updating records.
-

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.	1.1 Read and interpret documentation. 1.2 Identify required schedules for receipt or despatch. 1.3 Identify correct product/material. 1.4 Plan work sequence using workplace and product knowledge. 1.5 Select appropriate materials handling equipment as required. 1.6 Identify OH&S requirements.
2. Move materials into/out of storage or from production.	2.1 Check paperwork and identity of materials. 2.2 Check for completeness and/or damage. 2.3 Take action on non-conforming products/materials. 2.4 Handle and move products/materials into/out of storage safely. 2.5 Store materials safely as necessary.
3. Prepare goods for	3.1 Identify and read workplace procedures for

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.
despatch.	assembling and completing orders. 3.2 Select and check goods for despatch. against product/material knowledge, labels and other identification systems. 3.3 Sort, assemble and consolidate products as necessary. 3.4 Secure order and place in storage areas, in accordance with schedule. 3.5 Check order against despatch schedule and order form.
4. Complete materials movement records.	4.1 Complete materials movement records (in or out). 4.2 Update records as required. 4.3 Complete other paperwork and records as required.

Required Skills and Knowledge

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

Knowledge and understanding of the materials handling processes and requirements sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge is required of the product/material, its properties and uses sufficient for correct receipt, storage and despatching. Knowledge of the relevant OHS and environmental requirements is required along with an ability to implement them in a manner which is relevant to the materials handled.

Competence includes the ability to apply and/or describe:

- product/material knowledge
- inventory and ordering systems
- transport requirements and restrictions for products/materials
- correct OHS procedures
- storage/handling principles and procedures
- material hazard properties and their implications for safe handling and storage
- significance of material to customers; transport requirements and restrictions for materials
- plan own work, including predicting consequences and identifying improvements

- identify and describe own role and role of others involved directly in the processing of orders and despatching of products
- use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task
- distinguish between causes of problems such as product requirements and job priority as relevant to the practical completion of the job.

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 ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

Consistent performance should be demonstrated. For example, look to see that:

- packaging standards are met consistently
- procedures and work instructions are read and interpreted correctly
- potential problems are recognised and action is taken (ie, the problem is fixed or reported)
- action is taken to ensure problems are dealt with in a timely manner
- problems caused by product/material issues are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.
- effective communication between team members, supervisors and other staff is maintained.

Competence must be demonstrated in the operation of all ancillary equipment to the level required for this competency unit.

Assessment method and context

Assessment will occur using industrial equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by observation over time on a processing plant
- 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 covers the handling of a limited range of products/materials and their moving into and out of a plant/storage. It is NOT intended for people who, as a major function, operate a warehouse. The appropriate Transport and Distribution competencies should be used here.

This competency may require the operation of forklift trucks or other regulated load shifting devices which are NOT included in this competency, and so would be a co-requisite competency.

The terms order request, documentation, labels, transportation requirements 'paperwork' and 'records' mean any and all relevant information and data whether it is manual, paper based, electronic or verbal, either in person or by phone/radio.

This competency does not imply that moving materials into and from storage/plant are conducted equally, or even using similar techniques. Customers may be internal or external and the loading/unloading of products/materials may mean getting them onto/off a truck or simply from/to the next department.

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:

- mobile plant/fork lifts
- manual handling equipment
- hand tools
- shrink wrappers
- tape machine labellers
- loose bulk packing equipment.
- computers, bar code readers
- bag filling equipment
- pallets
- wrapping machines
- personal protective equipment (PPE)
- distribution equipment, including A-frames, stillages, containers, elevated platforms and communication equipment.

Hazards

Typical hazards include:

- inappropriate movements and postures
- physical and atmospheric hazards of materials
- height or depth of storage receptacles
- stationary and moving machinery, parts or components
- noise, light, energy sources
- humidity, air temperature, radiant heat
- 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:

- special storage requirements including moisture and contamination control
- handling of incomplete loads (either in or out)

- handling of materials which do not meet specifications
- conflicting priorities
- incomplete or incorrect paperwork.
- product requirements
- job priority
- product/material variations.

Variables

Key variables to be monitored include:

- types of products or materials to be received/despached
- handling heights
- types of equipment
- types of workplace documentation
- atmospheric conditions.
-

Unit Sector(s)

Not applicable.

MSAPMSUP204A Pack products or materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the packaging of products/materials to prepare them for despatch, warehousing, or storage. This competency is typically performed by operators or store personnel working either independently or as part of a work team.

Application of the Unit

Application of this unit

This competency applies to operators who package products and materials for despatch or storage. The key factors are correctly identifying the packaging requirements and using the technology required to package the goods/materials. It includes:

- identifying and interpreting the packaging requirements
- selecting the appropriate technology for packaging
- loading the product or material for on-forwarding
- packaging the load
- labelling the goods/materials after packaging.
- clearing up and leaving work area in a safe condition
- completing packaging documentation.
-

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. Prepare goods/materials for packaging.	1.1 Interpret packaging specifications. 1.2 Interpret order packaging documentation. 1.3 Select appropriate technology for packaging goods/materials. 1.4 Identify packaging materials and match specifications.
2. Package finished products.	2.1 Identify the nature of the product or material and the particular handling requirements. 2.2 Conduct process according to production specifications and organisational procedures. 2.3 Conduct equipment start up and run operation as necessary. 2.4 Employ ancillary equipment as necessary and use safe working procedures.
3. Stack, label and store finished products.	3.1 Consult company warehouse schedule or manifest to determine product or material, delivery, or storage and location requirements. 3.2 Label or mark products or materials following workplace labelling standards.

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 Set up work area, handling and storage equipment taking account of safety and efficiency. 3.4 Store products where required making safe and efficient use of storage space. 3.5 Complete workplace records/documentation. 3.6 Attach invoices and picking slips (where required).
4. Clear work area.	4.1 Store unpacked products, products for packaging and handling equipment in appropriate areas. 4.2 Clean equipment and make ready for re-use. 4.3 Clean work area, making it safe and ready for the next user. 4.4 Report and document equipment faults.

Required Skills and Knowledge

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

Knowledge and understanding of the equipment and packaging processes sufficient to recognise potential problems and to take appropriate action.

Knowledge of organisation standard procedures and work instructions and relevant regulatory requirements, along with the ability to implement them within appropriate time constraints and in a manner relevant to the operation of the equipment and packaging process.

Competence includes the ability to apply and/or describe:

- packaging procedures and processes
- safe set up of individual work area
- storage requirements for safety and efficiency
- production workflow requirements for packaging
- packaging methods to minimise waste
- identification symbols
- correct OHS procedures
- approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup
- waste management and importance of re-using non-conforming materials wherever possible

- correct selection and use of equipment, materials, processes and procedures
- distinguish between causes of faults such as products, equipment, packaging materials and items of equipment.

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
- safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task
- distinguish between causes of problems such as packaging and labelling requirements and goods being damaged after packaging.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product/material 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. x

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

It is essential that competence is demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

Consistent performance should be demonstrated. For example, look to see that:

- packaging standards are met consistently
- procedures and work instructions are read and interpreted correctly
- problems are identified and action is taken (ie the problem is fixed or reported)
- all safety procedures are followed
- product/material damage due to handling errors is minimised
- mislabelling opportunities are minimised

- problems relating to work are diagnosed and solved or reported
- waste is minimised
- effective communication between team members, supervisors and other staff is maintained.

Assessment method and context

Assessment will occur using industrial equipment and will be undertaken in a work-like environment

Competence in this unit may be assessed:

- by observation over time on a processing plant
- 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 persons handling a range of products, materials technology and the varied range of process procedures within an organisation. It includes the operation of all relevant ancillary equipment.

The terms documentation, labels and records means any and all relevant information and data whether it is manual, paper based, electronic or verbal, either in person or by phone/radio.

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:

- original manufacturer instructions and guidelines for the use of equipment
- relevant procedures relating to safe working practices prescribed for the equipment, product or material
- local OHS legislation and/or regulations
- site-specific instructions based on production requirements.

Tools and equipment

This competency may include use of equipment and tools such as:

- mobile plant/fork lifts
- manual handling equipment
- hand tools
- shrink wrappers
- tape machine labellers
- loose bulk packing equipment.
- computers, bar code readers
- bag filling equipment
- pallets
- wrapping machines
- personal protective equipment (PPE)
- distribution equipment including A-frames, stillages, containers, elevated platforms and communication equipment.

Hazards

Typical hazards may include:

- inappropriate movements and postures
- physical and atmospheric hazards of materials
- height or depth of storage receptacles
- stationary and moving machinery, parts or components
- noise, light, energy sources
- humidity, air temperature, radiant heat
- 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 malfunctions
- product specifications
- handling specifications
- insufficient space
- unusual size, shape or mass of products or materials
- insufficient goods to complete order
- conflicting priorities
- incomplete or incorrect paperwork.

Variables

Key variables to be monitored include:

- types of products or materials to be packed
- packing heights
- types of equipment
- types of workplace documentation
- atmospheric conditions
-

Unit Sector(s)

Not applicable.

MSAPMSUP205A Transfer loads

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the movement of loads using cranes and gantries. It applies to all sectors of the industry. Licensing or certification may be required by local Worksafe or other regulatory authority.

Application of the Unit

Application of this unit

This competency applies to operators who move loads using cranes and gantries. The key factors are applying knowledge of the nature of the load to be shifted, safety precautions required and the capacity of load shifting equipment and relevant support structures. This competency is typically performed by operators working either independently or as part of a work team. It includes:

- planning the correct method to move the goods
- safely securing the materials/goods to be shifted
- ensuring that the movement pathway is clear of obstacles and personnel
- moving the goods safely without damage to the goods, personnel or equipment.

This unit does not cover the use of a forklift truck - see *TDTD1097 Operate a forklift*

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites, however appropriate licences may be required.

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. Plan operation.	1.1 Correctly identify products, goods or material to be relocated. 1.2 Identify load characteristics including mass, volume, shape, balance and dimensions. 1.3 Identify most efficient and appropriate piece of equipment to be used. 1.4 Estimate points of balance. 1.5 Consider effect of moving contents which may be loose, liquid, dangerous or hazardous. 1.6 Determine location of storage. 1.7 Carry out risk analysis for job. 1.8 Complete required hazard controls. 1.9 Identify most efficient and appropriate movement route.
2. Prepare for lift.	2.1 Select appropriate lifting equipment 2.2 Check and test lifting gear as required 2.3 Calculate safe working load (SWL) or working load limit (WLL). 2.4 Clarify any non-standard 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.
	2.5 Report and replace any unsafe. 2.6 Secure movable/loose parts of load. 2.7 Attach load suitable for transfer.
3. Transfer load.	3.1 Prepare load destination to accept load. 3.2 Move load safely to required destination in accordance with planned procedure. 3.3 Use standard communication signals to coordinate safe movement of the load. 3.4 Remove equipment/gear/accessories safely from load. 3.5 Inspect equipment/gear/accessories for wear and damage, clean, maintain and store, and record usage and condition. 3.6 Complete site/job records.
4. Respond to routine problems.	4.1 Monitor transfer frequently and critically throughout load shifting using measured/indicated data and senses (eg sight, hearing) as appropriate. 4.2 Recognise transfer problems. 4.3 Identify and take action on causes of routine faults. 4.4 Log problems as required. 4.5 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.

Knowledge of the materials handling processes and requirements sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines. Knowledge of organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- apply and/or describe:

- appropriate points for locations of slings
- estimation/ calculation of mass
- requirements for safe working loads (SWL) or working load limits (WLL)
- production workflow and requirements for load shifting.
- 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 transferring loads with slings
- use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task
- distinguish between causes of problems such as:
 - balance points and behaviour of suspended loads
 - incorrect use of equipment.

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.

Numeracy is required to calculate loads and estimate balance points for slinging.

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 approved procedures
- take appropriate action to resolve problems or report problems to appropriate personnel.

Consistent performance should be demonstrated. For example, look to see that

- standards are met consistently
- upstream and downstream communication is timely and effective

- procedures and work instructions are read and interpreted correctly
- problems are identified and appropriate action is taken (ie the problem is fixed or reported)
- all safety procedures are followed.

Assessment method and context

Assessment will occur transferring industrial loads and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- on a processing plant, allowing for operation under all normal and a range of abnormal conditions
- in a situation allowing 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 operators using load shifting equipment such as cranes and gantries, slings, ropes, shackles, eye bolts, spreader beams, equalising gear, clamps, pulley systems, winches, packs, rigging screws.

Procedures

All operations are performed in accordance with procedures.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. These may include:

- regulatory authority's licence or certification requirements
- original manufacturer instructions and guidelines for the safe use of the equipment
- relevant procedures relating to safe working practices prescribed for the equipment
- local OHS legislation and/or regulations
- site-specific instructions based on production requirements.

Tools and equipment

This competency includes use of equipment and tools such as:

- cranes and gantries
- slings, ropes, chains or nets
- block and tackle
- shackles, bolts or turnbuckles
- jemmy bars
- relevant personal protective equipment.

Hazards

Typical hazards include

- unpredicted movement of loads
- loose goods
- volatile or hazardous materials and products
- irregular shaped loads
- unlabelled goods, materials and products.

Hazard controls

Typical hazards controls include:

- obtaining a permit to work as required
- determining coordination requirements with other site personnel
- determining job method to include hazard prevention and controls,
- Australian standards for safety procedures, codes of practice and manufacturer specifications
- erecting barricades, warning signs, overhead protection to requirements.

Checking lifting gear

Checking lifting gear includes:

- checking pulleys and block and tackle for safe operation and load capacity.

- checking ropes, cable, net and chain systems before use for safe condition and conformity to specification.
- conducting testing of ropes, cable, net and chain system when required to ensure safe operating capacity
- checking sling material for conformity with equipment and safety requirements.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- variations in load capacities of various sling materials
- frayed or damaged slings
- bolt or shackle failure
- lifting equipment failure.

Variables

Key variables to be monitored include.

- type and condition of slings or ropes
- type of load to be shifted
- physical dimensions
- physical or area hazards
- type of lifting equipment
- weather conditions (if outdoors)
- lighting and visibility in the loading/unloading area.
-

Unit Sector(s)

Not applicable.

MSAPMSUP210A Process and record information

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit of competency covers the provision and processing of all relevant information by responding to the information requirements of the plant including the completion of all workplace documents and clearly and concisely providing relevant information to others.

Application of the Unit

Application of this unit

This competency applies to operators who are required to provide information, orally or in writing in a one on one situation or as part of a group discussion.

The operator would:

- complete appropriate workplace forms
- provide appropriate workplace and technical information within their area of expertise
- identify routine information requirements seeking clarification where necessary.
-

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. Access information.	1.1 Identify the need for information. 1.2 Request appropriate information. 1.3 Access information in accordance with procedures. 1.4 Comply with security procedures in accessing appropriate information.
2. Provide appropriate information.	2.1 Deal with enquiries promptly and courteously. 2.2 Establish details of enquiry by questioning and summarising. 2.3 Provide appropriate information relevant to enquirer's request. 2.4 Organise information clearly, concisely and logically. 2.5 Provide information in a form that is readily understood by others. 2.6 Provide information in a timely manner. 2.7 Redirect enquiries to relevant personnel for resolution where outside the operator's area of responsibility.
3. Give and follow routine instructions.	3.1 Give accurate, clear and concise instructions that are consistent with the skills of the receiver. 3.2 Ensure that interaction with others is efficient, effective, responsive, courteous and supportive. 3.3 Confirm that instructions are understood.

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.
	3.4 Follow prescribed and routine work related sequences.
4. Provide reports.	4.1 Complete all workplace reports clearly and accurately in accordance with procedures. 4.2 Report all relevant information clearly and concisely.

Required Skills and Knowledge

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

Competence includes the ability to:

- describe importance of workplace documentation in relation to job role
- apply organization, operational, quality and safety policies and procedures
- apply workplace codes such as numbers, symbols, signs, colour and other codes.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret work instructions, procedures, operating manuals, job card and other documents provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required to the extent required by work instructions and 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.

Overview of assessment

Assessment will occur on the job or in a simulated workplace. In all cases it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

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

Competence must be demonstrated in the ability to provide and assess all required information and that the information provided both verbally and in writing is completed in a clear and concise manner, that is easily understood by others and in accordance with workplace requirements

Consistent performance should be demonstrated. For example, look to see that:

- reports and records are completed accurately, concisely and in accordance with procedures
- all information is provided in an efficient, effective, courteous and timely manner
- completion of shift handover, log books and company production records conveys all relevant information
- information sharing demonstrates effective communication processes such as turn-taking, participating in discussions and tolerating views of others in a way that contributes to the overall discussion
- notes of discussion are prepared so that they can be clearly interpreted by the receiver
- communication distinguishes between relevant and peripheral issues.

Assessment method and context

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. A holistic approach should be taken to the assessment.

Competence in this unit may be assessed:

- by observation and questioning to indicate understanding
- in a situation allowing the generation of evidence of the ability to respond to problems
- by using 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.

Reasonable adjustment of assessment tasks will be undertaken as required.

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 industry.

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 items of equipment such as:

- telephone
- two way radio
- computer equipment.

Information sources and plant documentation may include:

- operating procedures
- work instructions
- incident procedures
- operating manuals
- quality procedures
- training program contents/materials
- safety data sheets
- job cards
- maintenance logs
- non compliance reports
- incidence and accident reports
- permits
- schematics/process flows/engineering drawings.

Reports

Reports includes the following as appropriate to workplace requirements:

- oral

- written
- electronic
- handovers (giving/receiving).

Problems

Respond to routine problems means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- difficulty in quickly locating information required
- missing forms, logbooks etc.
- conflicting work priorities
- delays in reporting of information
- information is inaccessible
- absence of approver/ other signatories
- breakdown of communication equipment.

Appropriate action for non-routine problems may be reported to designated person or other action identified in the procedures.

Unit Sector(s)

Not applicable.

MSAPMSUP240A Undertake minor maintenance

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit applies to operators who are involved in providing basic maintenance and the resolving of routine problems to procedures. It does not cover activities normally requiring traditional trade training.

Application of the Unit

Application of this unit

In a typical scenario a plant operator does minor maintenance activities on the plant and equipment being operated. For instance the pressure drop across a filter unit may be high, indicating the filter cartridge needs changing. The operator takes the filter unit out of operation, cleans the unit, uses the correct spanner to open the lid, installs a fresh cartridge, closes the unit using the spanner again, then cleans up the area and disposes of the spent cartridge. Typically this sort of maintenance will be done on the plant and will not require workshop type facilities.

The operator will:

- be aware of and contribute to a safe working environment
- identify and check equipment for faults
- perform basic maintenance to procedures
- 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. Identify maintenance requirements.	1.1 Identify equipment variations/irregularities using observed data and plant records. 1.2 Assess the urgency/priority of the situation. 1.3 Identify appropriate corrective action. 1.4 Identify correct tools and materials. 1.5 Assess the impact of the maintenance activity and communicate to appropriate personnel. 1.6 Identify hazards and risk controls. 1.7 Identify work permit requirements.
2. Prepare for maintenance activity.	2.1 Ensure equipment is turned off and isolated as required. 2.2 Clear the area of obstructions and hazardous materials. 2.3 Obtain appropriate tools, parts, materials and procedures. 2.4 Obtain the appropriate work permits and adhere to the requirements. 2.5 Communicate the impending maintenance activity to the appropriate personnel.

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. Perform maintenance activity.	3.1 Access all relevant information. 3.2 Undertake maintenance activity according to procedures. 3.3 Use tools and maintenance techniques correctly. 3.4 Restore equipment to normal working condition. 3.5 Leave the work area in a clean and safe condition. 3.6 Ensure permits are signed off as appropriate.
4. Test equipment.	4.1 Test equipment according to procedures. 4.2 Return equipment to service. 4.3 Ensure equipment meets normal operating requirements.
5 Record maintenance activity.	5.1 Complete maintenance logs/plant history records. 5.2 Report maintenance activity to relevant personnel. 5.3 Identify and report outstanding maintenance requirements to relevant personnel.

Required Skills and Knowledge

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

Knowledge and understanding of equipment operation and maintenance practices sufficient to recognise fault and no-fault conditions in standard and non-standard situations and then determine appropriate action which is consistent with operational guidelines is required.

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 process. Application of approved hazard control, safety procedures, use of PPE in relation to handling materials, equipment operation and clean up.

Knowledge as a basis for solving maintenance problems, including:

- principles of operation of the equipment to be maintained
- function and troubleshooting of major internal components and their problems
- appropriate testing procedures and use of equipment for a range of equipment faults

- typical causes of equipment failures and the service conditions which may increase maintenance
- types and nature of maintenance (preventative, predictive, corrective) uses, benefits and limitations
- urgency and timeliness factors in maintenance
- maintenance planning/scheduling/records systems
- identification of tools, materials and spare parts
- basic techniques for using and handling tools
- physical measurement, alignment and clearance principles.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify factors which may affect product quality or production output and appropriate remedies
- identify when the operator is able to rectify faults and when assistance is required.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical equipment specifications schematics and diagrams.

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, to interpret plant data and maintenance schedules.

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.

Where the completion of this unit requires working under a permit/clearance, then competency must also be established in *PMAPER200C Work in accordance with an issued permit*, or other appropriate unit.

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 procedures and know the importance of critical operational systems
- recognise potential situations requiring action and then implement appropriate action.

Consistent performance should be demonstrated. For example, look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- appropriate equipment tests are undertaken and analysed appropriately
- proposals for equipment repair are based upon the most appropriate and cost effective method to return equipment to full performance in a timely manner
- maintenance activities are completed safely and to procedures.

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:

- on a processing plant, allowing for operation under all normal and a range of abnormal conditions
- in a situation allowing 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 industry. It does not include maintenance that would require trade level skills. It is not intended that this competency would cover maintenance that is carried out in a workshop.

Procedures

All operations are performed in accordance with procedures.

Procedures mean all relevant workplace procedures, work instructions, temporary instructions, standard operating procedures, plant description manuals, manufacturer instructions, specifications, service manuals, machine circuit diagrams for hydraulic/pneumatic and electrical/electronic circuits and relevant industry and government codes and standards.

Maintenance activities

This competency unit includes minor maintenance such as the following:

- operational maintenance (eg connection-disconnection of hoses, greasing, lubrication and lubricant systems, adjusting sealing glands, cleaning and changing filters, 'nipping up' flanges)
- general cleaning
- removal and replacement (eg gland packing, changing blades or cutters, replacing gaskets, replacing /maintaining seals, changing filter elements, servicing strainers).

Tools and equipment

This competency includes use of equipment and tools such as:

- hand tools
- specialised tools
- measuring and aligning equipment.

Hazards

Typical hazards include:

- rotating and moving machinery
- process materials, solids, liquids and gases under pressure or flowing
- hot surfaces or materials
- temporary connections or by-passes
- electrical, hydraulic or pneumatic energy sources
- out of specification operation.

Problems

Respond to/rectify 'non-routine problems' means 'apply known solutions to a variety of predictable problems'. Typical process and product problems may include:

- out-of-specification product or variations
- response of equipment to materials variations

- equipment in need of maintenance.

Variables

Key variables to be monitored include:

- equipment performance (eg speed, output, variations)
- equipment component performance
- sequences and timing of operations
- materials changes (desired and not desired).

Data and Records

Typical information sources, observed data and plant records may include:

- plant data
- log sheets
- operational and performance reports
- physical aspects such as noise, smell, feel and pressure condition monitoring information
- planned maintenance schedules
- procedures
- manufacturer specifications, instructions, service manuals and other information.
-

Unit Sector(s)

Not applicable.

MSAPMSUP280A Manage conflict at work

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the management of conflict in a range of situations where personal responsibility is required.

Application of the Unit

Application of this unit

This competency applies to operators who come into contact with other people either directly or indirectly and who are required to liaise and cooperate with other members of the team. It is applicable to the interaction between co-workers, between staff and customer/client, or between staff and supervisor.

This competency is typically performed working either independently or as part of a work team. The operator would:

- determine, from their behaviour or language, the other person's degree of concern or anxiety
- consider the reasons for the person's concerns and behaviour
- work towards finding common ground and opportunities for problem resolution
- consider possible courses of action and the other person's reaction to them
- take appropriate steps to resolve the conflict
- seek external assistance where the conflict could be or is escalating.
-

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 potential sources of conflict.	1.1 Identify actions which are likely to promote a reaction in others. 1.2 Assess the other persons needs and/or concerns. 1.3 Assess ability to respond to the other persons needs. 1.4 Recognise possible causes of conflict. 1.5 Identify potential conflict situations.
2. Identify range of alternative approaches.	2.1 Discuss with the other person their needs and concerns. 2.2 Discuss with other person own needs and concerns. 2.3 Identify a possible strategy through which these requirements may be achieved. 2.4 Develop a range of alternative strategies for achieving goals.
3. Resolve conflicts.	3.1 Identify areas of common ground or objectives that can be mutually supported. 3.2 Agree on a strategy which will meet the majority of objectives for both parties.

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 Implement the strategy. 3.4 Check that the agreed requirements are being met and that conflict has been resolved.
4. Respond to problems.	4.1 Identify possible problems in the conflict management process. 4.2 Determine problems needing action. 4.3 Determine possible causes. 4.4 Rectify problem using appropriate solution within area of responsibility. 4.5 Follow through items initiated until final resolution has occurred. 4.6 Report problems outside area of responsibility to designated person.

Required Skills and Knowledge

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

Knowledge and understanding of the process sufficient to recognise potential problems and not allow them to escalate to a conflict situation.

Knowledge of organisation standard procedures and work instructions and relevant regulatory requirements, along with the ability to implement them within appropriate time constraints and in a manner relevant to the operation of the process.

Competence also includes the ability to:

- apply mapping of conflict situations
- design options
- apply negotiation skills
- apply mediation skills
- distinguish between potential and actual conflict situations
- identify causes of conflict situations.

Language, literacy and numeracy requirements

This unit requires the ability to read and understand relevant procedures and work instructions as provided to operators.

Writing is required to the level of completing workplace forms.

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.

In all cases it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

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

It is essential that the process be understood and that the importance of interpersonal relationships is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

Consistent performance should be demonstrated. For example, look to see that:

- willingness to resolve situations is demonstrated
- statements are used that calmly reflect the requirements of participants
- statements focus on issues and facts, not people and personalities.

Assessment method and context

Assessment for this unit of competency will be on a processing plant or in a manufacturing environment.

Competence in this unit may be assessed:

- by observation or questioning to indicate understanding
- in a situation allowing 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 in the process manufacturing industries.

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 all such items of equipment and unit operations which form part of the human interaction system.

These may include:

- telephones, two-way radios
- emails, faxes
- memos, letters or emails
- verbal, face-to-face communications.

Hazards

Typical workplace hazards include:

- chemical and hazardous materials
- gases and liquids under pressure
- moving machinery
- materials handling

- working at heights, in confined spaces, or in environments subjected to heat, noise, dust or vapours.

Problems

Respond to routine problems means 'apply known solutions to a limited range of predictable problems'. Typical problems may include:

- anger or aggression arising from industrial relations matters
- disagreements over processes or work practices
- variations in opinions about circumstances or events
- interpersonal disputes arising from changes in personal circumstances.

Appropriate action for non-routine problems may be reporting to designated person or other action specified in the procedures.

Unit Sector(s)

Not applicable.

MSAPMSUP291A Participate in continuous improvement

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit applies to all employees who are required to be involved in process improvement initiatives.

Application of the Unit

Application of this unit

This competency is typically performed by an operator working independently or in a team.

The operator will:

- have knowledge of customers and suppliers
- identify areas of improvement
- identify strategies for improvement
- work with colleagues to implement changes for improvement to work processes.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit of competency 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 customers and suppliers.	1.1 Identify internal and external customers and suppliers. 1.2 Identify individual requirements. 1.3 Identify your role in meeting customer requirements.
2. Identify areas for improvement.	2.1 Identify issues affecting output and quality. 2.2 Identify instances of variation. 2.3 Follow enterprise procedures/work instructions for reporting and managing variations. 2.4 Record non-conformance in accordance with company requirements.
3. Identify strategies for improvement.	3.1 Analyse problems/areas for improvement. 3.2 Explain the use of information in developing improvements. 3.3 Use appropriate quality tools and techniques for identifying causes of problem and areas for improvement. 3.4 Suggest options for improvement. 3.5 Discuss a proposed improvement with others in a team.
4. Participate in a team to implement an improvement proposal.	4.1 Implement changes in system and procedures. 4.2 Monitor performance improvements. 4.3 Evaluate results of improvements with others in a team.

Required Skills and Knowledge

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

Knowledge and understanding of the process, normal operating parameters and product quality to recognise non-standard situations. Knowledge of the relevant OHS and environmental requirements is required along with an ability to implement them in a manner which is relevant to determining the corrective action and provision of recommendations.

Thorough knowledge of organisation standard operating procedures is required. Some appreciation of business goals is required as a basis for decision-making and action.

Competence to include the ability to apply and explain:

- principles of operation
- principles of recording and reporting
- analytical problem solving techniques.

Competence to include the ability to distinguish between causes of problems such as:

- process
- maintenance
- materials
- operations.

relevant to the ability to improve processes and procedures at that level.

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 interpret quality data and graphs.

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:

- appropriate documenting of the quality improvement process is undertaken
- enterprise procedures for identifying and suggesting improvements are followed
- the operator is able to participate in a team discussion
- enterprise procedures for implementing improvement proposals are followed
- standards are met consistently.

Consistent performance should be demonstrated.

Assessment method and context

Assessment will occur on-the-job or in a simulated workplace.

Competence in this unit may be assessed:

- in a situation allowing the generation of evidence of the ability to respond to 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 all work environments and sectors within the industries.

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:

- workplace forms and logs
- communication equipment for gathering and exchanging information, such as telephones, two-way radios, fax machines, email.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process problems may include:

- process and quality problems
- equipment selection, availability and failure
- teamwork and work allocation problems
- safety and emergency situations and incidents.
-

Unit Sector(s)

Not applicable.

MSAPMSUP292A Sample and test materials and product

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the taking of routine samples and the conducting of simple tests.

Application of the Unit

Application of this unit

This competency applies to operators who are required to undertake the routine sampling and testing in the workplace. Testing will typically also be done in the workplace or in a 'factory laboratory' (or bench) adjacent to/in the factory. Tests will be simple, routine tests to procedure. This competency is typically performed by operators working either independently or as part of a work team. The operator:

- takes the sample
- performs the test
- makes a simple interpretation of the test results
- takes actions specified based on the test results
- completes logs and reports.

More advanced sampling and testing should use the relevant units from *PML04 Laboratory Operations Training Package*.

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. Take sample.	1.1 Determine type of sample and sampling equipment required. 1.2 Check sampling equipment is clean and in good order. 1.3 Take sample(s) of required type(s), from the required place(s) and at the required time(s) and place in required container(s). 1.4 Label sample(s) to procedure. 1.5 Carry sample(s) to required place.
2. Complete test.	2.1 Check test required from procedures/work instruction. 2.2 Check sample identification and integrity. 2.3 Check test equipment is clean, in good order and within calibration. 2.4 Complete test(s) required as per standard procedures/instructions.
3. Interpret results and take action.	3.1 Note anything about sample, equipment or the test itself which may have caused it to give a bad result. 3.2 Compare results to specification.

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.
	3.3 Take action appropriate to the test results and any other observations.
4. Complete sample and test cycle.	4.1 Complete required records. 4.2 Store and/or dispose of sample as required. 4.3 Clean all equipment and leave ready for next sample/test.

Required Skills and Knowledge

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

Application of knowledge of the sampling and testing techniques used sufficient to recognise a suspicious test result cause by a fault in these areas.

Knowledge of organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Knowledge and skills in sampling and testing sufficient for consistent and meaningful test results including:

- basic principles of taking the particular sample
- basic principles of the particular test
- sample techniques and requirements
- test methods used and critical factors leading to good/poor test results.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical sampling and testing methods/procedures and to read and interpret numbers or other test result data.

Writing is required to the level of completing workplace forms and labelling samples.

Basic numeracy is required to read and interpret test results and undertake minor data manipulation such as might be required for the test, test interpretation or reporting.

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:

- take a sample correctly
- undertake tests with adequate reproducibility
- select and use the appropriate procedures.

Assessment method and context

Assessment will occur in a factory testing environment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by using appropriate, industrial testing regimes
- in a situation allowing 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 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 will 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 range of sampling and testing which may be carried out in a plant/factory, or in a manufacturing laboratory. It typically applies to operators who carry out a narrow range of tests as part of their job.

It does NOT include testing which would normally be conducted in a laboratory, nor operators carrying out a wide range of testing which is a significant part of their job role. These competencies are more properly covered by *PMLTEST300A Perform basic tests* or other units from the Laboratory Operations Training Package.

The tasks covered by this competency include:

- receiving, handling and storing samples
- preparing for sample collection
- performing sample collection
- performing sample preparation
- performing tests
- recording results.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical problems include:

- correct sampling technique
- test equipment condition/calibration
- consistent test technique according to standard procedure
- correct recording of result
- interpretation of result and the initiation of appropriate action
- correct retention/disposal of sample/test materials.
-

Unit Sector(s)

Not applicable.

MSAPMSUP300A Identify and implement opportunities to maximise production efficiencies

Modification History

Release 2 - Error in title of prerequisite unit corrected - Equivalent. No change to the prerequisite.

Unit Descriptor

Unit descriptor

This competency covers the ability to identify, monitor and participate in strategies to improve production efficiencies to meet set targets. It applies to all employees who are required to provide input into process improvement initiatives. The competency is typically performed by an experienced operator, team leader or supervisor.

Application of the Unit

Application of this unit

This unit covers the improvement of production such as occurs in the workplace but does not cover maximisation of process/equipment efficiencies undertaken as part of the operator's normal role, which is covered in the relevant operation/production competency unit.

The plant operator would:

- identify variances from production targets
- monitor performance against targets
- participate in and implement areas for improving process efficiencies.

Generally the plant operator would be part of a team in developing strategies to improve process efficiencies and may be expected to perform all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MSAPMSUP200A Achieve work outcomes

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 production performance.	1.1 Identify production targets for work area and work roles taking account of OHS. 1.2 Identify techniques used to measure production performance against targets/standards. 1.3 Record production performance in accordance with enterprise procedures.
2. Recognise issues that effect production process efficiencies.	2.1 Identify issues affecting output and quality. 2.2 Identify potential/actual sources of wastage. 2.3 Identify hazards and required controls associated with the process. 2.4 Identify strategies to minimise production inefficiencies without sacrificing OHS.
3. Monitor and measure performance against targets.	3.1 Monitor performance of process/equipment/raw material usage against targets. 3.2 Identify variations from targets and divergence from trends. 3.3 Use appropriate techniques to monitor actual performance against target. 3.4 Identify factors inhibiting performance.

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.
4. Participate in developing methods for improving process efficiencies.	4.1 Analyse problems/areas for improvement in process efficiencies. 4.2 Utilise appropriate problem solving tools and techniques for identifying areas for improvement. 4.3 Identify and take into account external factors. 4.4 Identify required changes to process, standards and procedures. 4.5 Recommend strategies for improvement to relevant personnel.
5. Participate in implementing process improvement strategies.	5.1 Implement developed strategies to minimise production inefficiencies and wastage. 5.2 Monitor performance improvement recommendations. 5.3 Evaluate results of improvements. 5.4 Report results to relevant personnel.

Required Skills and Knowledge

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

Knowledge and understanding of process sufficient to recognise deviations from target and recommend improvement strategies.

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 process. Application of approved hazard control, safety procedures, use of PPE in relation to handling materials, equipment operation and clean up.

Knowledge as a basis for identifying opportunities and recommending and implementing strategies, including:

- principles of the operation of the equipment
- relevant equipment and operational processes
- hazards associated with the process
- application of the hierarchy of control in controlling the hazards
- enterprise policies and procedures

- enterprise goals, targets and measures
- enterprise quality, OHS and environmental requirements
- obligations of employers under OHS legislation as applied to the production process
- enterprise information systems and data collation
- industry codes and standards.

Competence also includes the ability to:

- identify hazards of the materials and process
- implement appropriate procedures for hazard control
- use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical process documentation and charts.

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, to the level of identifying deviation from targets.

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 procedures and know the importance of critical operational systems
- recognise potential situations requiring action and then implement appropriate action.

Consistent performance should be demonstrated. For example, look to see that:

- production targets are identified and performance monitored against targets
- potential and actual issues/problems/hazards are recognised and clarified
- appropriate strategies are recommended to improve efficiency and productivity within team/department to achieve targets
- safety and environmental implications of recommendations are recognised and addressed
- participation in implementing strategies to improve process efficiencies is demonstrated.

Assessment method and context

Assessment will occur on-the-job, in a work-like environment or in a simulated workplace.

Competence in this unit may be assessed:

- on a processing plant, allowing for operation under all normal and a range of abnormal conditions
- in a situation allowing the generation of evidence of the ability to recognise, anticipate and solve 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 unit applies to a wide range of processes and equipment. In large plants with multiple processes, it may apply to more than one process if those processes interact with each other. It applies to all operators across all functions.

Procedures

All operations are performed in accordance with procedures.

Procedures mean all relevant workplace procedures, work instructions, temporary instructions, standard operating procedures and relevant industry and government codes and standards.

Sources of information

Sources of information may include:

- yearly, monthly, weekly and daily production targets
- business objectives and goals
- control charts, run charts and graphs
- enterprise manuals and procedures
- equipment specifications.

Sources of process inefficiencies and wastage

Sources of process inefficiencies and wastage may include:

- equipment downtime
- spillages
- leaks
- contamination
- raw material quality
- utilities usage
- productivity issues
- incorrect work allocation/priorities/planning
- incorrect processes/procedures.

Problems

Respond to/rectify 'non-routine problems' means 'apply known solutions to a variety of predictable problems'. Typical process and product problems may include:

- non-routine process and quality problems
- equipment selection, availability and failure
- teamwork and work allocation problems
- safety and emergency situations and incidents.
-

Unit Sector(s)

Not applicable.

MSAPMSUP301A Apply HACCP to the workplace

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency applies to senior operators working in sectors that make products which come into contact with food and beverages

This competency covers the application of a HACCP-based approach to food and beverage related products.

Acronyms used in this competency:

- CCP - critical control points
- CCF - critical control factors
- CCL - critical control limits
- HACCP - hazard analysis critical control points
- HAT - hazard analysis table.
-

Application of the Unit

Application of this unit

This competency unit covers the development/modification of a HACCP/HAT to the manufacture of products to be used in contact with food, beverages or pharmaceuticals. It assumes an understanding of the operation of all relevant equipment and processes but does not necessarily require them to be used personally.

This competency applies to all work environments and sectors within the industry where the product comes into contact with food, beverages or pharmaceuticals or otherwise requires 'food standard' to be maintained. Standard procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

It includes:

- applying the 'seven principles' of HACCP
- developing a HAT from a HACCP
- developing a new HACCP as part of a HACCP team
- making changes to existing HACCPs/HATs, resulting from process/material changes (provided such changes are not major requiring a complete new analysis)

- helping operators to apply and use the HACCP/HAT in their routine work.
-

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. Apply a HAT to an existing process.	1.1 Identify CCPs. 1.2 Recognise CCFs which are outside of or approaching CCLs. 1.3 Describe hazard related to CCFs and CCLs. 1.4 Implement corrective action as per HAT.

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.
2. Develop/modify a HACCP.	2.1 Conduct a hazard analysis. 2.2 Determine the CCPs. 2.3 Establish critical limits. 2.4 Establish/modify a system to monitor control of the CCPs. 2.5 Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control. 2.6 Establish procedures for verification to confirm that the HACCP system is working effectively. 2.7 Establish/modify documentation concerning all procedures and records appropriate to these principles and their application.
3. Interpret HACCP/HAT to another worker.	3.1 Explain the purpose and rationale of HACCP. 3.2 Identify CCPs, CCFs and CCLs. 3.3 Describe indicators of CCFs not within their CCLs. 3.4 Describe impact of non-conformances. 3.5 Demonstrate corrective action. 3.6 Monitor worker implement.

Required Skills and Knowledge

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

Knowledge and understanding of the materials, equipment and process sufficient to recognise HACCP/HAT issues and take appropriate corrective action.

Knowledge of organisation standard procedures, HACCPs and HATs and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Competence includes knowledge of:

- the HACCP approach
- HAT relevance to routine production
- impacts of variations in materials, process and product on HACCP

- the relevance of the Codex Alimentarius to food/beverage/pharmaceutical packaging and the ability to:
- apply the Codex Alimentarius to the food industry
- analyse process and material variations in terms of the HACCP and determine appropriate action(s)
- develop a new HACCP as part of a team
- recognise the need to modify an existing HACCP/HAT and make minor modifications.

Language, literacy and numeracy requirements

This unit requires the ability to read, interpret and write technical information and explain it to operators.

Writing is required to the level of writing technical reports and HACCP/HAT tables.

Numeracy is also required, eg to interpret quantitative data, make comparisons and interpretations.

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:

- recognise potential situations requiring action
- implement appropriate action
- understand the procedures
- explain the importance of CCPs, CCFs and CCLs.

Consistent performance should be demonstrated. For example, look to see that HACCP standards are met consistently.

Assessment method and context

Assessment will occur on a processing plant or in a manufacturing environment and will be undertaken in a work-like manner.

Competence in this unit may be assessed:

- by using an appropriate, industrial plant/process
- in a situation allowing for the generation of evidence of the ability to recognise, anticipate and solve 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 covers the development/modification of a HACCP/HAT to the manufacture of products to be used in contact with food, beverages or pharmaceuticals. It assumes an understanding of the operation of all relevant equipment and processes but does not necessarily require them to be used personally.

This competency applies to all work environments and sectors within the process manufacturing industries where the product comes into contact with food, beverages or pharmaceuticals. Standard procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

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.

Hazards

Typical hazards are:

- biological
- chemical
- physical
- product contamination
- material contamination.

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 process and product problems may include:

- recognising CCFs approaching the CCLs.
- determining corrective action from HAT
- applying HACCP principles to situations not directly covered by HAT
- recognising the need for a new/modified HACCP/HAT
- modifying HACCP/HAT to meet changes circumstances.
-

Unit Sector(s)

Not applicable.

MSAPMSUP303A Identify equipment faults

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit requires the application of planning, technical knowledge and skills to check and isolate routine and non-routine equipment faults used in production and report on the status of equipment. It applies to all sectors of the industry.

This competency is typically performed by operators demonstrating some relevant theoretical knowledge and using a range of well developed skills requiring some discretion and judgement

Application of the Unit

Application of this unit

This competency applies to operators who are required to apply knowledge of materials, product purpose and processes to the identification and isolation of faults in equipment. The key factors are the planning, checking and identification of routine and non-routine faults, in order to return the equipment to production.

The operator will:

- identify and plan scope of equipment checks
- check settings, adjustments and performance of equipment
- check materials for conformity to job requirements
- identify and isolate faults in equipment
- propose solutions and carry out solutions within scope of authority
- 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. Identify scope of operational check.	1.1 Identify and classify equipment components and operating systems. 1.2 Match appropriate tests and procedures to the equipment operating systems. 1.3 Identify special test procedures and parameters in manufacturer's specifications and procedures. 1.4 Explain the operating principles of hydraulic, pneumatic, mechanical and electrical/electronic systems as related to workplace equipment. 1.5 Implement measures to control identified hazards in line with procedures and duty of care. 1.6 Observe and undertake checks on the physical condition of equipment as per procedures. 1.7 Record preliminary observations. 1.8 Discuss test procedures with appropriate personnel and obtain necessary permission where 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.
2. Plan operational checks.	2.1 Check specifications and notes from preliminary observations and identify areas to be clarified. 2.2 Plan testing sequence/s noting areas where results and observations should be recorded. 2.3 Identify safe area for testing. 2.4 Make arrangements for any additional resources (including other employees).
3. Check unit through full operational range.	3.1 Undertake testing, observing relevant safety and operational requirements. 3.2 Confirm results and findings.
4. Identify fault and/or formulate recommendations.	4.1 Identify impact of fault on work schedule. 4.2 Record proposals for equipment repair based on faults found, cost/time implications and workplace approval systems. 4.3 Explain report to relevant workplace personnel including any options and recommendations. 4.4 Undertake repairs where appropriate in accordance with procedures.

Required Skills and Knowledge

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

Knowledge and understanding of equipment operation and maintenance practices sufficient to recognise fault and no-fault conditions in standard and non-standard situations and then determine appropriate action which is consistent with operational guidelines is required.

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 process. Application of approved hazard control, safety procedures, use of PPE in relation to handling materials, equipment operation and clean up.

Knowledge as a basis for solving processing and material problems, including:

- principles of the operation of the equipment to be maintained
- functions and troubleshooting of internal components and their problems

- routine and non-routine causes of equipment failures and the service conditions which may increase maintenance
- maintenance techniques, (eg reactive maintenance, predictive and preventative operational maintenance)
- appropriate testing procedures and use of equipment for a range of equipment faults
- operating principles for mechanical, hydraulic, pneumatic, electrical/electronic systems
- urgency and timeliness factors in planning maintenance activities in relation to production requirements
- collection, analysis and reporting of data.

Competence also includes the ability to:

- identify and select testing methods based on cost and time effectiveness
- conduct inspections, checks and tests on equipment as appropriate
- read and interpret circuit diagrams for mechanical, hydraulic, pneumatic and electrical/electronic operating systems
- use technical information and manufacturer information to locate relevant data
- interpret technical specifications and manufacturer instructions
- ensure workplace is safe for testing and maintenance of equipment
- identify hazards of the materials and process
- implement appropriate procedures for hazard control
- use PPE, safely handle products and materials, read relevant safety information
- apply safety precautions appropriate to the task.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical equipment specifications schematics and diagrams.

Writing is required to the level of completing workplace forms and production reports.

Basic numeracy is required, to the level of calculating equipment throughputs and performance.

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 procedures and know the importance of critical operational systems
- recognise potential situations requiring action and then implement appropriate action.

Consistent performance should be demonstrated. For example, look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- appropriate tests are undertaken and tests are analysed appropriately
- proposals for equipment repair are based upon the most appropriate and cost effective method to return equipment to full performance in a timely manner
- items initiated are followed through until final resolution has occurred.

Assessment method and context

It is preferred that assessment takes place on industrial equipment in a work environment.

Competence in this unit may be assessed:

- on a processing plant, allowing for operation under all normal and a range of abnormal conditions
- in a situation allowing the generation of evidence of the ability to recognise, anticipate and solve 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 industry. It does not include maintenance that would require trade level skills. It is not intended that this competency would cover maintenance that is carried on in a workshop.

Procedures

All operations are performed in accordance with procedures.

Procedures mean all relevant workplace procedures, work instructions, temporary instructions, standard operating procedures, plant description manuals, manufacturer's instructions, specifications, service manuals, machine circuit diagrams for hydraulic/pneumatic and electrical/electronic circuits and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- hand tools specific for the task
- product testing equipment (eg flowmeter, scales, tape measure, micrometer, caliper, ultrasonic thickness)
- machinery measuring equipment (eg vibration meter, tachometer, current tester, thermal imaging, temperature gauge)
- measuring and aligning equipment.

Hazards

Typical hazards include:

- rotating and moving machinery
- process materials, solids, fluids and gases under pressure or flowing
- temporary connections or by-passes
- electrical, hydraulic or pneumatic energy sources
- out-of-specification operation.

Problems

Respond to/rectify 'non-routine problems' means 'apply known solutions to a variety of predictable problems'. Typical process and product problems may include:

- out-of-specification product or variations
- response of equipment to materials variations
- new or changed materials
- changed equipment settings (eg higher speed or throughput)
- equipment in need of maintenance

- procedures requiring update or modification.

Variables

Key variables to be monitored include:

- equipment performance (eg speed, output, variations)
- equipment component performance
- sequences and timing of operations
- materials changes (desired and not desired).

Data and Records

Typical information sources, observed data and plant records may include:

- plant data
- log sheets
- operational and performance reports
- physical aspects such as noise, smell, feel and pressure condition monitoring information
- planned maintenance schedules
- procedures.
-

Unit Sector(s)

Not applicable.

MSAPMSUP309A Maintain and organise workplace records

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit covers the maintenance of workplace records in paper or electronic form. It may include sample products or materials for testing or quality purposes.

Application of the Unit

Application of this unit

This unit applies to employees who are required to maintain and organise workplace records.

The competency is normally used within approved workplace routines, methods and procedures. Discretion and judgement are required in the selection of equipment, work organisation, services and the allocation of work tasks within agreed time frames.

The employee will::

- identify and handle records in accordance with enterprise procedures
- track location of records
- apply security controls to ensure the integrity of records is not compromised
- maintain workplace records systems
- identify problems and take appropriate action.
-

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 records to be stored.	1.1 Identify purpose(s) of records to be maintained in relation to customer requirements, quality system or production requirements. 1.2 Identify requirements for completion of workplace records in accordance with workplace procedures. 1.3 Record and collate information ensuring appropriate information and any samples are included in an appropriate manner.
2. Maintain document filing arrangements.	2.1 Identify organisation system for records. 2.2 File records following workplace conventions. 2.3 Deal with obsolete or non-conforming records following workplace procedures.
3. Respond to information requests.	3.1 Interpret requests for information and prioritise. 3.2 Identify information requested and provide information within required workplace policies and time frames.
4. Organise file movements.	4.1 Identify files to be relocated. 4.2 Complete records of movement and file following workplace procedures.

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.
5. Maintain security of workplace records.	5.1 Identify security requirements for workplace records. 5.2 Maintain security arrangements for files. 5.3 Notify (any) security breaches to appropriate personnel.

Required Skills and Knowledge

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

Knowledge of organisation standard procedures, work instructions and relevant regulatory requirements along with the ability to implement them within appropriate time constraints relevant to the job.

Knowledge and skills in organising and maintaining a records system, including:

- identification and correct use of record keeping processes and procedures
- records generated at various stages of the production workflow and records access requirements
- focus of operation of record systems and equipment
- importance of records held and relevant procedures to maintain records to minimise time delays in accessing records
- maintenance of information for suppliers, customers and the enterprise.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify and describe own role and role of other employees in maintaining workplace records.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets, work instructions and material labels as provided to operators.

Writing is required to the level of completing workplace forms and reports.

Numeracy is also required to the extent required by production data, work instructions and 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.

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 and implement appropriate work processes for the filing and retrieval of workplace information
- identify and take appropriate action on problems and potential problems.

Consistent performance should be demonstrated. For example, look to see that:

- records are consistently filed and accessed in accordance with workplace procedures
- security precautions appropriate to the records are applied at all times.

Assessment method and context

Assessment will occur on-the-job or in a simulated workplace.

Competence in this unit may be assessed:

- by direct observation and accessing the workplace records system
- in a situation allowing the generation of evidence of the ability to recognise, anticipate and solve 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 in the industry.

Work is governed by established workplace procedures, and extent of authority for adjustments and other work activities are defined

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.

Documentation

This unit of competency includes sources of documentation such as:

- production reports
- job specifications
- production capability statements/specifications
- relevant workplace procedures and policies
- quality standards
- enterprise manuals
- machine or equipment instructions and readouts
- manufacturer specifications
- materials safety data sheets
- reliability, human resource, financial and production information
- relevant agreements, codes of practice and other legislative requirements.

Filing systems may be manual or computerised.

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 problems may include:

- lost files
- misfiling
- poor controls
- insufficient space/storage facilities
- incorrect destruction of records.

Appropriate action for problems outside of area of responsibility may be reported 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:

- retention schedules
- records movements and location.
-

Unit Sector(s)

Not applicable.

MSAPMSUP310A Contribute to the development of plant documentation

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit of competency covers the development of relevant plant documentation and systems in response to identified information requirements including the development and/or amendment of workplace documents, procedures and record keeping systems.

Application of the Unit

Application of this unit

This competency is typically performed by an experienced operator, leading hand or supervisor. The employee will:

- determine what needs to be done
- draft new/revised documentation
- arrange for documentation to be checked
- follow document control procedures.
-

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 information need/deficiency.	1.1 Determine the information requirements of the organization. 1.2 Evaluate current documentation. 1.3 Recognise information need/deficiency. 1.4 Discuss information requirements with appropriate personnel.
2. Develop/revise plant documentation.	2.1 Specify information need and set/prioritise objectives 2.2 Analyse existing documentation/records in accordance with specified requirements. 2.3 Develop/amend documentation as a draft in accordance with specifications to standard format. 2.4 Issue documentation to appropriate personnel for review. 2.5 Edit documentation and amend in accordance with review requirements. 2.6 Complete documentation to satisfy the initial identified need/deficiency.
3. Communicate changes to plant documentation.	3.1 Explain and communicate documentation to all relevant personnel. 3.2 Distribute documentation to all appropriate personnel. 3.3 Evaluate implementation of documentation.

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.
	3.4 Amend documents if required.

Required Skills and Knowledge

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

Knowledge of organisation standard procedures, work instructions and relevant regulatory requirements along with the ability to implement them within appropriate time constraints relevant to the job.

Knowledge of organisation information systems, procedures, equipment and relevant documentation sufficient to be able to develop or amend company documentation.

Knowledge of the relevant OHS and environmental requirements is required along with an ability to implement them in a manner which is relevant to the drafting of all relevant documentation.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify and describe own role and role of other employees.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets, work instructions and material labels as provided to operators.

Writing is required to the level of drafting documents for the required audience.

Numeracy is also required to the extent required by production data, work instructions and 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.

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

Consistent performance should be demonstrated. For example, look to see that:

- information required is researched, and intended use is taken into account
- documentation is completed accurately, concisely and in accordance with requirements
- completed documentation is easily understood by the recipient
- information is communicated in the appropriate manner
- communication distinguishes between relevant and peripheral issues.

Assessment method and context

Assessment will occur using work-based documents and in a work-like environment.

Competence in this unit may be assessed:

- by direct observation and accessing the workplace records system
- in a situation allowing the generation of evidence of the ability to recognise, anticipate and solve 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 in the industry.

Work is governed by established workplace procedures, and extent of authority for drafting/document approval.

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.

Documentation

This unit of competency includes sources of documentation such as:

- maintenance logs
- non-compliance reports
- incidence and accident reports
- permits
- schematics/process flows/ engineering drawings.
- job cards
- standard operating procedures
- work instructions
- operating manuals
- quality procedures
- training program contents
- materials safety data sheets.

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 problems may include:

- inaccurate source documents
- out-of-date source documents
- source documents too technical/lacking detail/of wrong focus
- prioritising of document drafting with other work.

Appropriate action for problems outside of area of responsibility may be reported to an appropriate person.

Appropriate action for solving problems within area of responsibility includes asking questions and seeking assistance from appropriate persons/sources

Unit Sector(s)

Not applicable.

MSAPMSUP330A Develop and adjust a production schedule

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit refers to the scheduling of production to meet operational requirements. It aims at ensuring that operators identify resource requirements, and document, monitor and adjust schedules in response to operational variations.

Application of the Unit

Application of this unit

This competency applies to operators who are required to optimise plant production and costs of production, using daily and weekly run plan guidelines/production schedules.

Typically, work would include authorising, planning, scheduling and prioritising of day to day activities.

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. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the Range Statement. 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. Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.
1. Identify resources to meet production requirements.	1.1 Determine demand for product. 1.2 Access and verify information on orders, stocks and delivery. 1.3 Determine material requirements. 1.4 Determine human resource requirements. 1.5 Determine health, safety or environment issues in meeting requirements.
2. Develop schedules	2.1 Determine production priorities. 2.2 Identify production opportunities ('windows'). 2.3 Develop production schedules in accordance with procedures taking account of safety requirements. 2.4 Communicate and distribute production schedules to appropriate personnel.
3. Monitor production schedules.	3.1 Monitor production output against schedule. 3.2 Identify variations between production and schedule. 3.3 Record operational variation and discuss with appropriate personnel. 3.4 Identify possible cause of variation.

4. Adjust schedules.	4.1 Adjust schedules in response to operational variation. 4.2 Adjust schedules in response to unexpected events. 4.3 Distribute adjusted/amended schedules to appropriate personnel. 4.4 Maintain product output in accordance with production and health, safety and environment requirements.

Required Skills and Knowledge

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

Competence includes the ability to apply and explain:

- production objectives, priorities, targets and resource requirements
- customer and quality requirements
- process and plant operational requirements
- hazards associated with the process
- awareness of the hierarchy of control in controlling the hazards
- impact of adjustments on process/plant efficiencies and production outcomes/targets
- safety implications for schedule/schedule changes
- planning, sequencing, monitoring and reviewing steps
- company policies and procedures

as is relevant to scheduling of production to meet operational requirements.

Language, literacy and numeracy requirements

This unit requires the ability to access and interpret a range of written, numeric and graphical data.

Writing is required to the level of interpreting orders (and forecasts) and producing schedules and related reports.

Numeracy is required to interpret numeric data and relevant statistics (such as trends and cycles) and from this calculate production and resource requirements.

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.

This unit may be best assessed using a range of scenarios/case studies and 'what ifs' as the stimulus with a walk-through of the scheduling process forming part of the response. These assessment activities should cover a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Critical aspects

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to

- identify resource requirements
- record, monitor and adjust schedules in response to operational requirements.

Consistent performance should be demonstrated. For example, look to see that:

- resource requirements are correctly identified in accordance with production requirements
- schedules are planned for the most effective and efficient manner to meet operational requirements
- schedules allow for safety, health and environmental (HSE) issues and reinforce HSE priorities
- timelines are adhered to
- schedules are adjusted and resource requirements amended in response to operational variations
- variations to schedules are communicated and documented appropriately.

Context of assessment

This unit of competency will be assessed:

- on a processing plant
- in as holistic a manner as is practical
- over a range of situations which will include disruptions to normal, smooth operation
- through questioning and the use of 'what if' scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant
- by using a combination of these techniques.

Assessment for this unit of competency may:

- be integrated with the assessment of other relevant units of competency
- require simulation to allow for timely assessment of parts of the unit, eg Elements 1 and 4. Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

Method of assessment

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 is typically performed by an experienced operator, team leader or similar.

Indicative functions include:

- regular planning operations
- communication with all relevant personnel, including management and administration.

Unit content areas include responses to:

- immediate production needs
- future production needs
- reworking requirements.

Indicative information sources and resources include:

- customer requirements
- organisational plans, policies and procedures
- production schedules, run plans
- resource utilisation actuals and targets.

All operations are performed in accordance with standard operating procedures.

Procedures

All operations are performed in accordance with procedures.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Health, Safety and Environment (HSE)

All operations are subject to stringent health, safety and environment requirements, which may be imposed through State or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the scheduler needs to ensure the HSE requirements take precedence.

Unit Sector(s)

Not applicable.

MSAPMSUP382A Provide coaching/mentoring in the workplace

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the skills and knowledge required to act as a mentor/coach to other individuals in the workplace. Coaching and mentoring are undertaken within the coach/mentor's area of expertise on a one on one basis.

The mentoring/coaching process applies to any area of the business or professional endeavours such as acquisition of specific business competencies, progress with overall business development, individual and personal development.

Application of the Unit

Application of this unit

This competency is typically performed by senior operators or team leaders who have significant workplace experience. At all times they would be liaising with relevant personnel when undertaking the coaching/mentoring role.

The coach/mentor would:

- facilitate the exploration of needs, motivations and thought processes to assist the individual in identifying areas for development
- observe, listen and ask questions to identify the employee's situation
- use questioning techniques to identify solutions and actions rather than take a directive approach
- support the employee in setting appropriate goals and methods of assessing progress in relation to goals
- provide encouragement, support and constructive feedback
- apply tools and techniques which may include one on one training, facilitating, counselling and networking
- evaluate outcomes of process to ensure the employee is achieving goals.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.

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. Establish coaching/ mentoring relationship.	1.1 Identify areas for development in line with organisational and individual's requirements. 1.2 Use effective communication styles to develop trust, confidence and rapport. 1.3 Make agreements on how the relationship will be conducted, including: • the amount of time involved for both parties • confidentiality of information • identification of development opportunities • development plan towards achieving goals. 1.4 Discuss and clarify expectations and goals.

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.
	1.5 Seek input from other relevant personnel if required.
2. Provide coaching/ mentoring support.	2.1 Assist the individual to identify and evaluate opportunities to achieve agreed goals/development activities. 2.2 Share personal experiences and knowledge with the individual to assist in progress to agreed goals/development. 2.3 Provide a supportive environment to allow the individual to develop towards the achievement of goals. 2.4 Encourage the individual to make decisions and take responsibility for the courses of actions or solutions under consideration. 2.5 Provide assistance and guidance in a manner which allows the individual to retain responsibility for achievement in their goals.
3. Evaluate effectiveness of coaching/mentoring.	3.1 Recognise and openly discuss changes in the coaching/mentoring relationship. 3.2 Make adjustments to the relationship to take account of the needs of both the mentor/coach and the individual. 3.3 Seek feedback from individual and other relevant personnel to identify and implement improvements.

Required Skills and Knowledge

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

Knowledge of the principles of coaching and mentoring for development of competence.

Knowledge of organization standard procedures and work instructions and relevant regulatory requirements along with the ability to apply them to the coaching/mentoring process.

Competence also includes the ability to:

- work effectively with individuals who have diverse work styles, aspirations, cultures and perspectives
- use effective methods of coaching/mentoring

- apply organisation policies, procedures and plans
- apply methods and techniques for eliciting and interpreting feedback
- explain relevant career paths and competency standards in the organisation
- apply methods for identifying development opportunities
- use effective planning skills to organise activities
- give, receive and analyse feedback effectively

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret organisation requirements which may be included in:

- quality assurances and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- OHS policies, procedures and programs
- confidentiality and security requirements
- business and performance plans
- anti-discrimination and related policy
- access and equity principles and practice
- ethical standards
- quality and continuous improvement processes and standards.

Writing is required to the level of completing records and reports.

Numeracy is required to the extent required by work instructions and 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.

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 an understanding of mentoring/coaching and its role and benefits is understood. Competence must be demonstrated in communication skills in relation to listening, questioning, providing constructive feedback and non-verbal communication.

Consistent performance should be demonstrated, in particular:

- an understanding in the role and benefits of mentoring/coaching in the business

- use of significant workplace knowledge and experience to assist another individual to achieve their goals/development needs
- application of effective communication styles
- effectively creating a learning environment that allows for open discussion, feedback, tolerance of mistakes during learning, within a safe environment, and affirmation of the individual's worthiness.

Assessment method and context

Assessment will occur on-the-job or in a simulated workplace.

Competence in this unit may be assessed:

- by observation or questioning to indicate understanding
- in a situation allowing 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 in the process manufacturing industries.

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:

- relevant process equipment, components and auxiliary equipment
- PPE.

Hazards

Typical workplace hazards include:

- chemicals and hazardous materials
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in confined spaces, or in environments subjected to heat, noise, dusts or 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/a solution recorded in the procedures.

Typical problems may include:

- lack of materials and resources
- conflicting work priorities
- time constraints.
- lack of cooperation
- lack of willingness to receive feedback

Appropriate action for non-routine problems may include reporting to designated person or other action specified in the procedures.

Unit Sector(s)

Not applicable.

MSAPMSUP383A Facilitate a team

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the identification of team's goals and timelines, negotiating with the team to allocate tasks and ensuring the goals and timelines are met.

Application of the Unit

Application of this unit

This competency is typically performed by team leaders/operators who work within a team structure and are responsible for coordinating team functions within designated goals. It also requires the use of a range of well developed skills requiring some discretion and judgement to recognise and resolve a range of problems/conflict.

The team leader will:

- collect, analyse and organise information
- communicate ideas and information
- plan and organise activities
- work within a team
- use mathematical ideas and techniques
- solve problems
- use technology.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit of competency 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 tasks to achieve team goals.	1.1 Identify and agree on team goals, with team members input. 1.2 Identify tasks required to achieve team goals. 1.3 Identify team and individual safety responsibilities. 1.4 Allocate responsibilities of individuals within the team. 1.5 Ensure designated team goals are met by identifying strategies and timelines required to complete each task.
2. Organise allocation of tasks.	2.1 Estimate time and resources needed to complete tasks. 2.2 Identify competencies of individual team member and allocate/negotiate individual responsibilities. 2.3 Agree timelines for completion of each task. 2.4 Identify resources and support necessary for completion of job.
3. Monitor completion of allocated tasks.	3.1 Measure team performance against its goals. 3.2 Monitor individual compliance with procedures and take action as required.

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.
	3.3 Check at regular intervals that agreed timelines for completion of tasks are being met. 3.4 Negotiate alternative strategies to achieve allocated tasks when designated timelines are not being met. 3.5 Provide support to colleagues to ensure completion of allocated tasks.
4. Resolve conflicts between team members.	4.1 Identify conflict situations between team members. 4.2 Identify causes of conflict. 4.3 Implement conflict resolution procedures relevant to the level of conflict and to established practices. 4.4 Seek assistance as required to ensure conflict resolution.

Required Skills and Knowledge

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

Application of knowledge and understanding of the system sufficient to indicate understanding and knowledge of negotiating with team members to allocate and complete tasks to achieve team goals.

Knowledge of organization procedures, quality requirements and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Application of the knowledge of managing risk using the hierarchy of controls applied to the manufacture of products. Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and clean up.

Knowledge as a basis for solving problems, including:

- effective use of teamwork
- impact of individual team member strengths/weaknesses/competencies on the allocation of responsibilities
- OHS roles and responsibilities of the individual and the team
- effective use of workplace documentation
- teamwork strategies
- working to timelines

- allocation of tasks
- health, safety and environment obligations of employers and employees imposed by the relevant legislation.

Competence includes the ability to:

- plan own work, including predicting consequences and identifying improvement
- identify and describe own role and role of others involved in the team
- identify team and individual goals relevant to the practical operation of the system
- identify team, section and organisation goals relevant to the practical operation of the system.

Language, literacy and numeracy requirements

This unit requires the ability to read and understand typical procedures and work instructions, plant drawings and safety information as provided to operators.

Writing is required to the level of completing workplace forms, quality assurance records and production reports.

Basic numeracy is required to the extent required by work instructions and 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.

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 and prioritise work activities
- negotiate and monitor work activities
- understand the impact of individual tasks on the completion of team objectives
- allocate and oversee that tasks are completed safely and within timelines
- ensure relevant procedures are followed and used when completing activities
- identify and take appropriate action on problems or potential problems.

Consistent performance should be demonstrated. For example, look to see that:

- willingness to participate as part of a group is demonstrated
- support is sought from and given to colleagues to achieve team objectives

- all safety procedures are always followed.

Assessment method and context

Assessment will occur in work-like environment.

Competence in this unit may be assessed:

- in a situation allowing the generation of evidence of the ability to recognise, anticipate and solve 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 in the industries.

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.

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 problems may include:

- required information/materials not available
- required tool/equipment not available
- conflicting priorities
- short timeframe.

Variables

This competency unit may vary according to organization use of the following information sources and documentation:

- procedures/work instructions
- materials safety data sheets
- job cards
- maintenance logs
- plant drawings.

Key variables to be monitored include:

- type of communication used within each organisation
- established work practices/policies
- size and structure of the team/organisation
- group goals - individual, team and organisation
- organisation specific conflict resolution procedures.
-

Unit Sector(s)

Not applicable.

MSAPMSUP390A Use structured problem solving tools

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the solving of process and other problems, beyond those associated directly with the process unit/equipment, using structured process improvement tools to identify improvements and/or solve problems.

Application of the Unit

Application of this unit

The competency is typically performed by an experienced operator, team leader or supervisor.

Generally the person would be part of a team during the solving of complex or systemic problems and would be expected to perform all parts of this unit and at all times would be liaising and cooperating with other members of the team. This includes:

- using a range of formal problem solving techniques
- identifying and clarifying the nature of the problem
- devising the best solution
- evaluating the solution
- developing an implementation plan to rectify the problem.

This unit does not cover the solving of problems undertaken as part of the operator's normal role which is covered in the relevant operation competency unit.

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 the problem.	1.1 Identify variances from normal operating parameters and product quality. 1.2 Define the extent, cause and nature of the problem by observation and investigation. 1.3 State and specify the problem clearly.
2. Determine fundamental cause of problem.	2.1 Identify possible causes based on experience and the use of problem solving tools/analytical techniques. 2.2 Develop possible cause statements. 2.3 Identify fundamental cause.
3. Determine corrective action.	3.1 Consider all possible options for resolution of the problem. 3.2 Consider strengths and weaknesses of possible options. 3.3 Determine corrective action to remove the problem and possible future causes. 3.4 Develop implementation plans identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures. 3.5 Develop recommendations for ongoing monitoring

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.
	and testing.
4. Communicate recommendations.	4.1 Prepare report on recommendations. 4.2 Present recommendations to appropriate personnel. 4.3 Follow up recommendations if required.

Required Skills and Knowledge

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

Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognise non-standard situations.

This unit of competency includes use of analytical techniques in problem solving such as:

- brainstorming
- fishbone diagrams/cause and effect diagrams
- process logic/process requirements
- logic tree
- similarity/difference analysis
- Pareto analysis
- force field/SWOT analysis
- flow charts
- control charts, runcharts and graphs
- scattergrams.

Action plans to solve problems are prepared including:

- priority requirements
- measurable objectives
- resource requirements
- methods for reaching objectives
- timelines
- coordination and feedback requirements
- safety requirements
- risk assessment
- environmental requirements.

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 report writing and completing workplace forms.

Basic numeracy is also required, eg to interpret quality data and graphs.

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 and explain:

- relevant equipment and operational processes
- enterprise policies and procedures
- enterprise goals, targets and measures
- enterprise quality, OHS and environmental requirements
- principles of decision-making strategies and techniques
- enterprise information systems and data collation
- industry codes and standards.

Consistent performance should be demonstrated. For example, look to see that:

- problems are recognised and clarified
- possible causes are identified, based on experience and use of analytical techniques in solving the problem, including:
 - identifying variations
 - identifying cause and effect
 - separating single problems from multiple problems
 - recognising recurring problems.
- fundamental cause of process or equipment faults is determined
- corrective/preventative implementation plans are developed to avoid recurrence of the problem
- implementation plan is presented to relevant personnel.

Assessment method and context

Assessment will occur on the job or in a simulated workplace.

Competence in this unit may be assessed:

- in a situation allowing the generation of evidence of the ability to recognise and 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 unit applies to a wide range of processes and equipment. The process manufacturing technical units of competency include a problem solving element where problems specific to that competency unit are to be resolved. This competency unit is where structured problem solving techniques are to be applied more broadly, or with greater depth/rigour than is implied by the problem solving element of the technical units.

In large plants or manufacturing organisations with multiple processes, it may apply to more than one process if those processes interact with each other. It applies to all operators across all functions.

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.

Hazards

Typical hazards include leaks, spillages and equipment hazards that can occur during the walk-through of a plant.

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 process and product problems may include:

- non- routine process and quality problems
- equipment selection, availability and failure
- teamwork and work allocation problems
- safety and emergency situations and incidents.
-

Unit Sector(s)

Not applicable.

MSAPMSUP400A Develop and monitor quality systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the establishment, maintenance and evaluation of quality systems for a complete production area and/or plant.

Application of the Unit

Application of this unit

This competency is typically performed by an experienced technician, leading hand or supervisor. It includes:

- developing and implementing quality systems
- identifying and maintaining documentation for the quality systems
- implementing training programs
- evaluating the quality system and making improvements where necessary.
-

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. Establish and maintain framework for successful quality system.	1.1 Develop relevant policies which demonstrate the commitment of the enterprise to quality and a culture of improvement. 1.2 Define and allocate responsibilities in quality system. 1.3 Consult with key personnel to define role of procedures in the quality system. 1.4 Seek and provide financial and human resources to allow thorough implementation of quality system. 1.5 Develop system for communicating quality message and culture in the organisation.
2. Establish and maintain quality documentation system.	2.1 Identify quality documentation required, including records of improvement plans and initiatives. 2.2 Prepare and maintain quality documentation and keep data records. 2.3 Maintain document control system.
3. Implement structured training program in accordance with quality system requirements.	3.1 Analyse roles and duties of relevant personnel. 3.2 Identify training needs in relation to quality. 3.3 Identify training programs to meet these needs. 3.4 Implement the training program. 3.5 Develop and maintain training records.
4. Evaluate the quality system.	4.1 Undertake regular audits of the quality system, its policies and procedures. 4.2 Develop new procedures/work instructions as required.

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.
	4.3 Implement improvements in the quality system.

Required Skills and Knowledge

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

Knowledge and understanding of organisation quality systems and appropriate national and international quality standards and protocols.

Knowledge of the relevant OHS and environmental requirements and detailed knowledge of enterprise standard operating procedures is required.

An appreciation of business goals and key performance indicators is required as a basis for decision making and action.

Competence to include the ability to apply and explain the principles of:

- process improvement
- policy and procedure development
- data management and documentation.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret quality procedures and work instructions, quality manuals, equipment manuals as is applicable to developing quality systems and procedures.

Writing is required to the level of developing quality documentation.

Numeracy is also required, eg to analyse quality data or charts.

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:

- effectively maintain and evaluate quality systems carried out
- implement relevant staff training programs
- produce adequate quality documentation including policies and procedures.

Consistent performance should be demonstrated. For example, look to see that:

- the development, implementation and evaluation of the quality system runs smoothly
- all safety procedures are always followed.

Assessment method and context

Assessment will occur in a work-like environment.

Competence in this unit may be assessed:

- in a situation allowing the generation of evidence of the ability to recognise, anticipate and solve 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 a wide range of processes and equipment in all work environments and sectors in the process manufacturing industries.

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 workplace documentation such as:

- organisational policies
- quality manuals
- standard operating procedures and work instructions
- company business objectives
- key performance indicators).

Quality audits and evaluations may be undertaken as an individual or as part of a team.

Hazards

Typical hazards include leaks, spillages and equipment hazards that can occur during the walk-through of an operating plant or factory.

Problems

Typical problems may include:

- lost documentation
- maintaining updated documents
- staff not following procedures
- poor communication.
-

Unit Sector(s)

Not applicable.

MSL936001A Maintain quality system and continuous improvement processes within work_functional area

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers responsibility for the day-to-day operation of the work/functional area and ensuring that quality system requirements are met and that continuous improvements are initiated.

Application of the Unit

Application of the unit	This unit of competency is applicable to senior technical officers and laboratory supervisors working in all industry sectors. Quality audits and evaluations for the work area may be undertaken as an individual or as part of a team under broad direction from scientists/medical staff/engineers. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These can be found at the end of this unit of competency under the section 'This competency in practice'.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Develop and maintain quality framework within work area	1.1.Distribute and explain information about the enterprise's quality system to personnel 1.2.Encourage personnel to participate in improvement processes and to assume responsibility and authority 1.3.Allocate responsibilities for quality within work area in accordance with quality system 1.4.Provide coaching and mentoring to ensure that personnel are able to meet their responsibilities and quality requirements
2. Maintain quality documentation	2.1.Identify required quality documentation, including records of improvement plans and initiatives 2.2.Prepare and maintain quality documentation and keep accurate data records 2.3.Maintain document control system for work area 2.4.Contribute to the development and revision of quality manuals and work instructions for the work area 2.5.Develop and implement inspection and test plans for quality controlled products
3. Provide training in	3.1.Analyse roles, duties and current competency of

ELEMENT	PERFORMANCE CRITERIA
quality systems and improvement processes	relevant personnel 3.2. Identify training needs in relation to quality system and continuous improvement processes 3.3. Identify opportunities for skills development and/or training programs to meet needs 3.4. Initiate and monitor training and skills development programs 3.5. Maintain accurate training records
4. Optimise and report performance	4.1. Review performance outcomes to identify ways in which planning and operations could be improved 4.2. Enhance customer service through the use of quality improvement techniques and processes 4.3. Adjust plans and communicate these to personnel involved in their development and implementation
5. Evaluate relevant components of quality system	5.1. Undertake regular audits of components of the quality system that relate to the work area 5.2. Implement improvements in the quality system in accordance with own level of responsibility and workplace procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- implementing and monitoring defined quality system requirements
- initiating continuous improvements within the work area
- applying effective problem identification and problem solving techniques
- strengthening customer service through a focus on continuous improvement
- implementing, monitoring and evaluating quality systems
- gaining commitment of individuals/teams to quality principles and practices
- implementing effective communication strategies
- encouraging ideas and feedback from team members when developing and refining techniques and processes
- analysing training needs and implementing training programs

REQUIRED SKILLS AND KNOWLEDGE

- preparing and maintaining quality and audit documentation

Required knowledge

Required knowledge includes:

- communication/reporting protocols
- continuous improvement principles
- enterprise business goals and key performance indicators
- enterprise information systems management
- enterprise organisational structure, delegations and responsibilities
- policy and procedure development processes
- relevant health, safety and environment requirements
- relevant national and international quality standards and protocols
- standard operating procedures (SOPs) for the technical work performed in work area
- the enterprise quality system

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

Assessors should ensure that candidates can:

- implement and monitor defined quality system requirements and initiate continuous improvements within the work area
- apply effective problem identification and problem solving techniques
- strengthen customer service through a focus on continuous improvement
- implement, monitor and evaluate quality systems in the work area
- initiate quality processes to enhance the quality of performance of individuals and teams in the work area
- gain commitment of individuals/teams to quality

EVIDENCE GUIDE	
	principles and practices • implement effective communication strategies • encourage ideas and feedback from team members when developing and refining techniques and processes • analyse training needs and implement training programs • prepare and maintain quality and audit documentation.
Context of and specific resources for assessment	This unit of competency should be assessed in a laboratory environment that either meets Australian standards for working laboratories or is accredited by NATA or the Royal College of Pathology, as appropriate. Competency in this unit should be assessed over a sufficient period of time to enable the candidate to initiate and implement improvements. This unit of competency may be assessed with: • <i>MSL915001A Provide information to customers.</i> Resources may include: • quality manuals and documentation • quality tools, such as Pareto charts, strengths, weakness, opportunities, threats (SWOT) analysis and plan, do, check, act (PDCA) • quality and customer data.
Method of assessment	The following assessment methods are suggested: • observation of the candidate leading a quality improvement team • review of verified reports of improvement initiatives and/or projects conducted by the candidate • feedback from peers, team members, supervisors, quality manager and customers • review of quality documentation prepared and maintained by the candidate • review of training places prepared by the candidate for personnel in the work area • review of audit processes and outcomes generated by the candidate • questions to assess underpinning knowledge of procedures and contingency management. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those

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	aspects of competency which are difficult to assess directly. 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. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case studies below to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. Manufacturing The laboratory supervisor with a pharmaceutical company had participated in the production of a company wide quality manual. This manual was distributed to the various work teams and an induction program for all workers was undertaken to familiarise them with the demands of the quality system. A transient, sharp improvement in laboratory operations was observed after which the quality metrics fell (although not to pre-quality system levels). The supervisor investigated this phenomenon and found that many of the analytical specifications determined by the company were detailed in the quality manual and nowhere else. Put simply, after an initial period during which laboratory personnel consulted the manual for guidance, there was a tendency for the personnel to rely more on their memories and less on the manual. The supervisor made it clear to personnel that 'guessing' procedures and methodologies was unacceptable. If they were uncertain of something they must consult the manual. Awareness of this problem allowed the supervisor to be more vigilant in monitoring laboratory operations and personnel eventually developed the habit of referring to the manual as required. A subsequent review of the manual went smoothly and efficiently. The staff were familiar with the manual's strengths and shortcomings and had made annotations for

EVIDENCE GUIDE

improvements that were readily incorporated during the review.

Environmental

Collection of botanical specimens for research purposes required personnel to record data at the time of collection in a prescribed format. A quality audit conducted by the laboratory supervisor indicated that some documentation was incomplete. The supervisor also found that sometimes documentation was completed later, from memory, rather than in the field. The supervisor met with the collectors involved, reinforced the enterprise protocols, explained the importance of diligent record keeping in achieving valid research outcomes and gained a renewed commitment to quality from the personnel. Subsequent quality audits indicated that the personnel had met their commitment and the research work was no longer jeopardised.

Food processing

The laboratory supervisor of a food processing company had noted over recent years that the requests of some customers were virtually impossible to fulfil. For example, one customer wanted a bleached flour which had not undergone any chemical treatment or adulteration for a particular market niche. Another customer wanted analytical results within an unrealistic timeframe. While none of these requests had caused serious friction between the company and its customers, the supervisor decided to take a proactive stance to address the not altogether unreasonable ignorance of some customers. After consulting with the laboratory manager, the supervisor invited all customers to tour the laboratory, during which the aims and limitations of the analytical procedures were explained. The tour gave customers the opportunity to assess their demands of the company and generate more realistic ideas for modifying the company's products to suit their needs. The outcomes of this exercise were that company-customer relations were improved, the future expectations of some customers were more practical and the company's ongoing program of product improvement was facilitated by customer input.

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.

Codes of practice

Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used

Standards, codes, procedures and/or enterprise requirements

Standards, codes, procedures and/or enterprise requirements may include:

- Australian and international standards, such as:
 - AS 1199 Sampling procedures and tables for inspection by attributes
 - AS ISO 17025-2005 General requirements for the competence of testing and calibration laboratories
 - AS/NZS ISO 10005:2006 Quality management systems - Guidelines for quality plans
 - AS/NZS ISO 10012:2004 Measurement management systems - Requirements for measurement processes and measuring equipment
 - AS ISO 10013-2003 Guidelines for quality management system documentation
 - AS/NZS ISO 9000 Set:2008 Quality management systems set
 - AS 1199 Sampling procedures and tables for inspection by attributes
- Association of Analytical Communities International (AOAC International) Official Methods of Analysis
- Australia New Zealand Food Standards (ANZFS) Code
- Australian code of good manufacturing practice for medicinal products (GMP)
- BS 5750 Quality systems
- Codex Alimentarius standards

RANGE STATEMENT	
	• customer specific requirements/standards • enterprise and customer product specifications • hazard analysis and critical control points (HACCP) principles • National Association of Testing Authorities (NATA) Accreditation programs requirements • National Health and Medical Research Council (NHMRC) Guidelines • national measurement regulations and guidelines • principles of good laboratory practice (GLP) • quality manuals and procedures • Therapeutic Goods Regulations 1009
Quality audits	Quality audits may include: • regular checks of laboratory procedures • daily and weekly checks of specimen reception, instrumentation and results for control and standard samples to identify non-conformance and problem areas • maintenance of appropriate certified reference materials (CRMs) • participation in external quality assurance programs
Communication	Communication may involve: • supervisors, managers and quality managers • laboratory and production personnel • customers and suppliers • auditors
Reporting	Reporting may include: • verbal responses • data entry into laboratory or enterprise databases • written reports
Documentation	Documentation may include: • sampling plans • enterprise quality manual • quality (certification or registration) requirements • audit documents

RANGE STATEMENT	
	• performance plans and reports • training records and/or plans • workplace procedures relating to occupational health and safety (OHS), equal opportunity (EO) and environmental legislative requirements • industrial awards and enterprise agreements
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Maintenance

Competency field

Competency field	

Co-requisite units

Co-requisite units	

Co-requisite units		

MSL952001A Collect routine site samples

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to collect samples at field or production sites using specified equipment and standard or routine procedures.

Application of the Unit

Application of the unit	This unit of competency is applicable to production operators, field assistants and laboratory assistants in all industry sectors. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These are found at the end of this unit of competency under the section 'This competency in practice'.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for sampling	1.1. Confirm the purpose, priority and scope of the sampling request 1.2. Liaise with relevant personnel to arrange site access and all necessary clearances/permits 1.3. Identify site hazards and review enterprise safety procedures 1.4. Confirm what samples are to be collected, from where, how and when 1.5. Assemble all specified sampling equipment, safety equipment, materials and containers 1.6. Conduct pre-use and cleanliness checks of all items to ensure they are fit for purpose 1.7. Check all items against given inventory and stow them to ensure safe transport
2. Conduct sampling	2.1. Locate sampling points and services at the site 2.2. Remove security devices, such as locks and covers as required 2.3. Seek advice if the required samples cannot be collected or if procedures require modification 2.4. Select and use required sampling equipment in accordance with given procedures 2.5. Closely follow sampling procedures to obtain required samples and maintain their integrity

ELEMENT	PERFORMANCE CRITERIA
	2.6. Record all labelling information in accordance with enterprise/legal traceability requirements 2.7. Record sample appearance, environmental conditions and any other factors that may impact on sample integrity 2.8. Replace security devices, such as locks and covers as required
3. Finalise sampling	3.1. Follow enterprise procedures for the cleaning/decontamination of equipment and vehicle as necessary 3.2. Check all equipment, materials and samples against inventory and stow for safe transport 3.3. Liaise with relevant personnel to restore normal production and/or services as necessary 3.4. Maintain integrity of samples during transportation 3.5. Deliver samples to the required collection point and complete all documentation to ensure traceability 3.6. On return, check and document serviceability of equipment before storage
4. Maintain a safe work environment	4.1. Use established work practices and personal protective equipment to ensure personal safety and that of others 4.2. Minimise environmental impacts of sampling and generation of waste 4.3. Dispose of all waste in accordance with enterprise procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- collecting a variety of samples at a range of sites closely following sampling procedures
- collecting samples safely with minimal environmental impact
- maintaining the integrity and security of samples

REQUIRED SKILLS AND KNOWLEDGE

- demonstrating enterprise and/or legal traceability requirements
- liaising with others to access sites and conduct sampling efficiently
- recognising own limitations the seeking timely advice

Required knowledge

Required knowledge includes:

- key terminology and concepts, such as sample, contamination, traceability, integrity and chain of custody
- concepts of metrology
- the international system of units (SI)
- purpose for which the samples have been collected
- the function of key sampling equipment/materials and principles of operation
- hazards, risks and enterprise safety procedures associated with routine sampling undertaken
- enterprise procedures dealing with:
 - sampling
 - waste management, clean up and spillage
 - handling, transport and storage of dangerous goods
- relevant health, safety and environment requirements

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**

Assessors should ensure that candidates can:

- correctly follow sampling procedures and plans when collecting samples
- collect samples efficiently, safely and with minimal environmental impact
- maintain the integrity and security of samples following the traceability requirements
- recognise limitations and seek timely advice.

Context of and specific resources for

This unit of competency is to be assessed in the

EVIDENCE GUIDE	
assessment	workplace or simulated workplace environment. This unit of competency may be assessed with: • <i>MSL972001A</i> Conduct routine site measurements. Resources may include: • variety of sample types • sampling procedures • a selection of sampling containers, equipment and documentation.
Method of assessment	The following assessment methods are suggested: • review of sampling documentation completed by the candidate • review of the quality of samples collected by the candidate • observation of the candidate collecting a variety of samples at a range of sites • feedback from supervisors and clients that sampling plans were followed • oral/written questioning about sampling and safety procedures. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. 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. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case studies below to illustrate the practical application of this unit of competency and show its relevance in a workplace setting. Construction materials testing A laboratory assistant takes daily tar samples from the

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company's retort which is used to heat tar to reduce its moisture content. The purpose of this sampling program and subsequent testing is to ensure that the water content of the hot tar is at a safe level before the tar is transferred to a road tanker and used for road construction. Serious accidents can occur during the transfer or use of tar as high water content can cause an explosion due to escape of steam. One day, the retort operator was running behind schedule and tried to convince the laboratory assistant that the water content of the tar was the same as yesterday and didn't need to be tested. The laboratory assistant was able to explain that a high water content could lead to a serious explosion and burns for the operator.

Environmental

A new field assistant was collecting samples of environmental run-off during wet weather. To successfully complete the activity, the assistant made sure that they included a sample thief, pipette, or similar to extract the sample, a container with a secure lid, and an indelible marker to write on the label. In addition, the assistant remembered to take sealable, waterproof plastic bags in which to put the containers once the samples were collected and a spare bag to protect the field notebook from rain damage.

Manufacturing

A production operator has been given the task of collecting samples of the recent batches of blended products, prior to drumming and customer delivery. In addition, the operator is required to sample the bulk raw materials stored on-site, and the drummed blend ingredients, including some powdered pigments.

The operator knows that the lab needs the blend samples first and after putting on chemical gloves and safety glasses, accesses each sample point on each of the blend tanks. Because the products are under pressure in the tank manifold, it is important to guard against splashes. Some of the products are flammable hydrocarbons, so the operator ensures that static leads are connected from the tank to the sample vessel during pouring. To sample the drummed product, a sample thief is used and again, safety glasses and chemical gloves are important. The pigments present a dust hazard when being sampled, so the operator applies a protective mask over their nose and

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	mouth, to prevent ingestion while they use a small purpose-built shovel to empty the contents into the sample container.

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.

Codes of practice

Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used

Standards, codes, procedures and/or enterprise requirements

Standards, codes, procedures and/or enterprise requirements may include:

- Australian and international standards, such as:
 - AS ISO 1000-1998 The international system of units (SI) and its application
 - AS ISO 17025-2005 General requirements for the competence of testing and calibration laboratories
 - AS/NZS ISO 14000 Set:2005 Environmental management standards set
 - AS/NZS ISO 9000 Set:2008 Quality management systems set
- calibration and maintenance schedules
- enterprise recording and reporting procedures
- enterprise sampling procedures for specific samples, sites and clients
- environmental legislation and regulations
- equipment manuals
- equipment startup, operation and shutdown procedures
- industry codes of practice
- maps and site plans

RANGE STATEMENT	
	• material safety data sheets (MSDS) • material, production and product specifications • National Association of Testing Authorities (NATA) documents regarding construction materials testing • national measurement regulations and guidelines • occupational health and safety (OHS) national standards and codes of practice • quality manuals • safety procedures • standard operating procedures (SOPs)
Site hazards	Site hazards may include: • solar radiation, dust and noise • wildlife, such as snakes, spiders and domestic animals • biohazards, such as micro-organisms and agents associated with soil, air and water • chemicals, such as acids and hydrocarbons • sharps and broken glassware • manual/handling of heavy sample bags and containers • crushing, entanglement and cuts associated with moving machinery and hand tools • falling objects, uneven surfaces, heights, slopes, wet surfaces, trenches and confined spaces • vehicle handling in rough terrain and boat handling in rough or flowing water
Safety procedures	Safety procedures may include: • use of MSDS • use of personal protective equipment, such as hard hats, heavy protection, gloves, safety glasses, goggles, faceguards, coveralls, gowns, body suits, respirators and safety boots • correct labelling of hazardous materials • handling and storing hazardous material and equipment in accordance with labels, MSDS, manufacturer's instructions and enterprise procedures and regulations • regular cleaning and/or decontamination of

RANGE STATEMENT	
	equipment • machinery guards • signage, barriers, service isolation tags, traffic control and flashing lights • lockout and tag-out procedures
Types of samples	Types of samples may include: • grab samples • disturbed or undisturbed materials • composite samples, such as time, flow proportioned and horizontal/vertical cross section • quality control samples, such as controls, background, duplicate and blanks
Materials sampled	Materials sampled may include: • gas or air samples • water, wastewater, stormwater, sewage and sludge • soils • construction materials • solid wastes, such as commercial, industrial and mining • raw materials, start, middle, end of production run samples and final products for a wide range of manufactured items, including food and beverages • hazardous materials and/or dangerous goods
Sampling tools and equipment	Sampling tools and equipment may include: • front-end loader, backhoe, excavator and drill rig • shovels, augers and bucket • sampling frames, sampling tubes, dip tubes, spears, flexible bladders and syringes • access valves • sample thief • weighted sample bottles, bottles, plastic/metal containers and disposable buckets • sterile containers, pipettes, inoculating loops and disposable spoons • pumps and stainless steel bailers

RANGE STATEMENT	
Maintenance of integrity of samples	Maintenance of integrity of samples could include: • appropriate containers and lids (e.g. glass, plastic, amber and opaque) • sealing of sample containers • purging of sample lines and bores • decontamination of sampling tools between collection of consecutive samples • use of appropriate preservatives (e.g. sodium azide, toluene or antibiotics) • wrapping container in foil or wet newspaper • temperature control, which may involve prevention of direct contact between the sample and coolant • transfer of sterile sample into sterile container • monitoring of storage conditions • enterprise/legal traceability through appropriate sample labelling and records
Services	Services may include: • water supply, gas and electricity • telecommunications • irrigation, stormwater and drainage systems • production plant
Minimising environmental impacts	Minimising environmental impacts may involve: • replacement of soils and vegetation • driving to minimise soil erosion and damage to fauna and vegetation • disposal of surplus, spent or purged materials • recycling of non-hazardous wastes • appropriate disposal of hazardous waste • cleaning of vehicles to prevent transfer of pests and contaminants
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time

RANGE STATEMENT

	- all operations assume the potentially hazardous nature of samples and require standard precautions to be applied - where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Sampling

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MSL954001A Obtain representative samples in accordance with sampling plan

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to obtain a range of samples that are representative of the source material (e.g. raw ingredients, product in process and final product) and to prepare the samples for testing. All sampling activities are conducted in accordance with a defined sampling plan. This unit does not cover the subsequent testing of the samples.

Application of the Unit

Application of the unit	This unit of competency is applicable to laboratory technicians in all industry sectors. It involves: • a range of sampling plans, samples and sampling procedures, which apply to the enterprise site, plant laboratory or field sites • enterprise products/materials and hazardous materials • a range of sampling points and/locations. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These are found at the end of this unit of competency under the section 'This competency in practice'.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for sampling	1.1. Confirm the sampling location, number and type of samples, and timing and frequency of sampling from enterprise or client's sampling plan 1.2. Liaise with relevant personnel to arrange site access and, if appropriate, all necessary clearances and/or permits 1.3. Select sampling equipment and conditions to achieve representative samples and preserve sample integrity during collection, storage and transit 1.4. Check that all procedures are in accordance with client or enterprise requirements, relevant standards and codes 1.5. Identify site and sampling hazards and review enterprise safety procedures

ELEMENT	PERFORMANCE CRITERIA
	1.6. Assemble and check all sampling equipment, materials, containers and safety equipment 1.7. Arrange suitable transport to, from and around site as required
2. Conduct sampling and log samples	2.1. Locate sampling sites and, if required, services at the site 2.2. Conduct representative sampling in accordance with sampling plan and defined procedures 2.3. Record all information and label samples in accordance with traceability requirements 2.4. Record environment or production conditions and any atypical observations made during sampling that may impact on sample representativeness or integrity 2.5. Transport all samples back to base according to standard operating procedures (SOPs) and relevant codes
3. Prepare samples for testing	3.1. Prepare sub-samples and back-up sub-samples that are representative of the source 3.2. Label all sub-samples to ensure traceability and store in accordance with SOPs 3.3. Follow defined preparation and safety procedures to limit hazard or contamination to samples, self, work area and environment 3.4. Distribute sub-samples to defined work stations maintaining sample integrity and traceability requirements
4. Address client issues	4.1. Enter approved information into laboratory information management system (LIMS) 4.2. Report all relevant aspects of the sampling and preparation phases in accordance with enterprise procedures 4.3. Ensure that information provided to client is accurate, relevant and authorised for release 4.4. Maintain security and confidentiality of all client/enterprise data and information
5. Maintain a safe work environment	5.1. Clean all equipment, containers, work area and vehicles according to enterprise procedures 5.2. Check serviceability of all equipment before storage 5.3. Use defined safe work practices and personal protective equipment to ensure personal safety and that of other laboratory personnel

ELEMENT	PERFORMANCE CRITERIA
	5.4. Minimise the generation of wastes and environment impacts 5.5. Ensure the safe collection of all hazardous wastes for appropriate disposal

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- collecting representative samples in accordance with a sampling plan
- techniques to preserve the integrity of samples
- identifying atypical materials and samples and taking appropriate action
- maintaining sampling equipment
- completing sampling records
- working safely
- following requirements for the disposal of waste and the preservation of the environment

Required knowledge

Required knowledge includes:

- principles of representative samples
- principles and procedures for random, systematic and stratified sampling, consistency of sampling procedures
- preservation of the integrity of samples
- maintaining identification of samples relative to their source
- enterprise and/or legal traceability requirements
- cost effectiveness of sampling
- characteristics of product/material to be sampled and likely contaminants
- links between quality control, quality assurance, quality management systems and sampling procedures
- enterprise procedures dealing with legislative requirements for the handling, labelling and transport of hazardous goods
- links between correct occupational health and safety (OHS) procedures and personal and environmental safety particularly at high risk sites

REQUIRED SKILLS AND KNOWLEDGE

Specific industry

Additional knowledge requirements may apply for different industry sectors. For example: Biomedical and environmental services:

- specific legislation on biohazards
- documentation procedures for the chain of custody for samples to be used as evidence or for blood transfusion

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

Assessors should ensure that candidates can:

- collect the specified quantity of sample to enable all processing and testing to occur and back-up samples to be stored
- obtain a sample that is representative of the bulk material
- preserve the integrity of samples by closely adhering to procedures
- label samples and sub-samples to satisfy enterprise/legal traceability requirements
- identify atypical materials and samples and take appropriate action
- maintain sampling equipment in appropriate condition
- complete sampling records using enterprise procedures
- follow safety regulations and enterprise OHS procedures during sampling, transport and storage
- follow relevant legislative requirements for the disposal of waste and the preservation of the environment.

Context of and specific resources for assessment

This unit of competency is to be assessed in the workplace or simulated workplace environment.

EVIDENCE GUIDE	
	This unit of competency may be assessed with: • <i>MSL924001A Process and interpret data</i> • <i>MSL943002A Participate in laboratory/field workplace safety</i> • <i>relevant MSAL974000 series units of competency</i> • <i>relevant MSAL975000 series units of competency relevant to the sampling.</i> Resources may include: • variety of sample types • sampling plans • a selection of sampling containers and sampling equipment.
Method of assessment	The following assessment methods are suggested: • inspection of samples collected by the candidate • review of sampling documentation completed by the candidate • feedback from peers, customers and supervisors that sampling plans were followed • questioning to assess underpinning knowledge of representative sampling procedures • observation of the candidate taking a range of samples. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. 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. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case studies below to illustrate the practical application of this unit of competency and to show its relevance in a workplace

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setting.

Manufacturing

A metallurgical laboratory technician is very familiar with preparing representative samples for a range of final products in a steelmaking plant. One day, he/she is asked to sample a 50 tonne small-particle coal delivery which is believed to have a higher than acceptable sulphur content. Having never prepared representative samples for such a large quantity of material, the technician consulted their supervisor and developed an appropriate sampling plan. The technician arranged for the operator of a small front-end loader to take buckets of coal from five equally spaced points around the pile. The resulting material was then combined and mixed in one heap. The technician coned and quartered the heap enough times to obtain a representative sample of about 5kg. He/she arranged for the unwanted material to be returned to the stockpile. On return to the laboratory, the technician crushed the sample and repeatedly coned and quartered the material to obtain an analytical portion.

Environmental

A field technician trained in sampling natural water systems is asked to sample a bright yellow industrial wastewater discharge into a small creek. The relevant sampling plan specifies that the samples should be collected where the waste water is well mixed near the centre of the creek and at the mid-depth point. The technician also notes that the samples must be collected where turbulence is at a maximum so that the settling of solids is minimal. On arrival at the site, the technician locates where the wastewater is entering the creek. He/she moves downstream to where the waste water and creek water is well mixed and there is little apparent loss of the yellow suspended solids. The technician dons the required personal protective equipment and uses a convenient bridge to collect a set of six samples and duplicates over a half-hour period using the equipment and procedures specified in the sampling plan. Using a field notebook, the technician records all information specified in the laboratory's chain of custody requirements and safety plan for handling potentially hazardous industrial waste.

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.

Codes of practice

Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used

Standards, codes, procedures and/or enterprise requirements

Standards, codes, procedures and/or enterprise requirements may include:

- Australian and international standards, such as:
 - AS 1199 Sampling procedures and tables for inspection by attributes
 - AS 1678 Emergency procedure guide -Transport
 - AS 1940-2004 Storage and handling of flammable and combustible liquids
 - AS 3780-2008 The storage and handling of corrosive substances
 - AS 4433.2-1997 Guide to the sampling of particulate materials - Preparation of samples
 - AS/NZS 4452:1997 The storage and handling of toxic substances
- American Association of Cereal Chemists (AACC) Approved Methods of Analysis
- Australian Dangerous Goods Code
- enterprise and/or client sampling schemes and sampling plans
- enterprise recording and reporting procedures
- gene technology regulations
- material safety data sheets (MSDS)
- methods and procedures which may be written to meet enterprise, client and/or regulatory/certifying body requirements
- National Code of Practice for the labelling of workplace substances [NOHSC:2012 (1994)]
- site plans, maps and specifications

RANGE STATEMENT	
Basic principles of sampling	Basic principles of sampling include: • representative samples • preservation of integrity of samples • maintaining identification of samples relative to their source, enterprise and legal traceability • cost-effectiveness of sampling • consistency of sampling procedures • sampling principles, including random, systematic and stratified sampling
Materials sampled	Materials sampled may include: • gas or air samples • liquid samples, such as water, groundwater, waste water, stormwater, sludges and sewage • solid samples, such as soil, sediments, rocks, concrete, quarry and mining material • solid wastes • raw materials, start, middle, end of production run samples, final products and materials used in production processes, such as flocculants • plants • animals • microbiological samples
Types of samples	Types of samples may include: • grab samples • composite samples • quality control samples • research or one-off samples • environmental or survey samples
Sampling tools and equipment	Sampling tools and equipment may include: • shovels, augers and chain saws • sampling frames, sampling tubes, dip tubes, spears, flexible bladders and syringes • front-end loader, backhoe, excavator and drill rig • sample bottles or containers, plastic containers and disposable buckets • access valves • sample thief • auto samplers

RANGE STATEMENT	
	• pumps and stainless steel bailers • traps and cages • sterile containers, pipettes, inoculating loops and disposable spoons
Maintenance of integrity of samples	Maintenance of integrity of samples may include: • use of compatible container, such as glass, plastic, amber and opaque bottles • use of appropriate preservatives, such as sodium azide, toluene or antibiotics • decontamination of sampling tools between collection of consecutive samples • wrapping container in foil • purging of sample lines and boxes • handling and transport to avoid disturbance or damage • temperature control which may involve insulation of sample without direct contact with the coolant • wrapping in wet newspaper, cloth, sand or sawdust • transfer of sterile sample into sterile container • monitoring of storage conditions
Site and sampling hazards	Site and sampling hazards may include: • solar radiation, dust and noise • wildlife, such as snakes, spiders and domestic animals • biohazards, such as micro-organisms and agents associated with soil, air, water, blood and blood products, and human or animal tissue and fluids • chemicals, such as acids and hydrocarbons • aerosols • sharps and broken glassware • manual handling of heavy sample bags and containers • crushing, entanglement and cuts associated with moving machinery and hand tools • vehicular and pedestrian traffic
Safety procedures	Safety procedures may include: • use of MSDS

RANGE STATEMENT	
	• use of personal protective equipment, such as hard hats, hearing protection, gloves, safety glasses, goggles, face guards, coveralls, gowns, body suits, respirators and safety boots • use of biohazard containers and laminar flow cabinets • correct labelling of reagents and hazardous materials • handling, and storing hazardous materials and equipment in accordance with labels, MSDS, manufacturer's instructions, and enterprise procedures and regulations • regular cleaning and/or decontaminating equipment and work areas • machinery guards • signage, barriers, service isolation tags, traffic control and flashing lights • lockout and tag-out procedures
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Sampling

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MSL973001A Perform basic tests

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to perform tests and measurements using standard methods with access to readily available advice from supervisors.

Application of the Unit

Application of the unit	This unit of competency is applicable to laboratory/field assistants working in all industry sectors. In general, they do not calibrate equipment and make only limited adjustments to the controls. They do not interpret or analyse results or troubleshoot equipment problems. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These are found at the end of this unit of competency under the section 'This competency in practice'.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Interpret test requirements	1.1. Review test request to identify samples to be tested, test method and equipment involved 1.2. Identify hazards and enterprise controls associated with the sample, preparation methods, reagents and/or equipment
2. Prepare sample	2.1. Record sample description, compare with specification, record and report discrepancies 2.2. Prepare sample in accordance with appropriate standard methods
3. Check equipment before use	3.1. Set up test equipment in accordance with test method 3.2. Perform pre-use and safety checks in accordance with enterprise procedures and manufacturer's instructions 3.3. Identify faulty or unsafe equipment and report to appropriate personnel 3.4. Check calibration status of equipment and report any out of calibration items to appropriate personnel
4. Perform tests on samples	4.1. Identify, prepare and weigh or measure sample and standards to be tested

ELEMENT	PERFORMANCE CRITERIA
	4.2. Conduct tests in accordance with enterprise procedures 4.3. Record data in accordance with enterprise procedures 4.4. Perform calculations on data as required 4.5. Identify and report out of specification or atypical results promptly to appropriate personnel 4.6. Shut down equipment in accordance with operating procedures
5. Maintain a safe work environment	5.1. Use established safe work practices and personal protective equipment to ensure personal safety and that of other laboratory personnel 5.2. Minimise the generation of wastes and environmental impacts 5.3. Ensure safe disposal of laboratory and hazardous wastes 5.4. Clean, care for and store equipment and reagents as required

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 enterprise procedure or standard methods accurately
- using safety information, such as material safety data sheets (MSDS) and performing procedures safely
- checking test equipment before use
- completing all tests within required timeline without sacrificing safety, accuracy or quality
- calculating, recording and presenting results accurately and legibly
- maintaining security, integrity and traceability of all samples, data/results and documentation
- cleaning and maintaining equipment

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge includes:

- concepts of metrology
- the international system of units (SI)
- purpose of test
- principles of the standard method
- pre-use equipment checks
- relevant standards/specifications and their interpretation
- sources of uncertainty in measurement and methods for control
- enterprise and/or legal traceability requirements
- interpretation and recording of test result, including simple calculations
- procedures for recognition/reporting of unexpected or unusual results
- relevant health, safety and environment requirements

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

Assessors should ensure that candidates can:

- accurately interpret enterprise procedures or standard methods
- complete all tests within the required timeline without sacrificing safety, accuracy or quality
- demonstrate close attention to the accuracy and precision of measurements and the data obtained
- maintain the security, integrity and traceability of all samples, data/results and documentation.

Context of and specific resources for assessment

This unit of competency is to be assessed in the workplace or simulated workplace environment.

This unit of competency may be assessed with:

- *MSL922001A Record and present data.*

Resources may include:

- standard laboratory equipped with appropriate

EVIDENCE GUIDE	
	equipment standards and materials • enterprise procedures and standard methods, and equipment manuals • MSDS.
Method of assessment	The following assessment methods are suggested: • review of the quality of test data/results achieved by the candidate over time • inspection of records and workplace documentation completed by the candidate • feedback from peers and supervisors • observation of the candidate performing a range of basic tests • oral or written questioning to check underpinning knowledge of test procedures. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. 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. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case studies below to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. Manufacturing Standard testing methods may be viewed as legal requirements that must be followed to ensure that a product manufactured in a chemical plant meets the specification by which it is sold to the customer. Technical assistants perform tests in a quality control laboratory to ensure that material meets legal requirements and the material is safe and effective in use. Peroxides may be present in ether as a result of

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light-catalysed air oxidation. Peroxides are toxic and can give rise to mixtures which are explosive when distilled. Technical assistants test ether to ensure that the level of peroxide is within acceptable limits. The test is done by shaking ether with a solution of potassium iodide. After standing for 30 minutes in the dark the yellow colour of the aqueous phase, due to the liberation of iodine, must not be more intense than a prepared standard solution. These tests ensure the quality and safety of the ether.

Food processing

A snack food company produces a range of high quality, impulse purchase snack foods. Some of these products are moisture and/or oxygen sensitive and are therefore packaged in multi-layer flexible packaging to provide optimum shelflife. The packaging must also be able to withstand the rigours of the production and distribution process. While the packaging is purchased to meet the shelflife and distribution specifications, the quality assurance program requires the periodic evaluation of the packaging materials against these specifications. A laboratory assistant uses standard methods to test the tearing resistance, bursting strength, impact resistance and permeability and/or leakage of the snack food packaging. Tests are also conducted on aspects of the manufacturing process that can affect shelflife. These tests involve the measuring of the heat-seam strength and the sealing performance of the closure process. The test results are recorded by the laboratory assistant to verify the conformance of the materials to the supplier specifications and of the process to the manufacturing specifications. The assistant reports any anomalies or non-conformances to the appropriate personnel.

Construction materials testing

A technician performs an Aggregate Stripping Test (AS 1141.50) and enters the results in the laboratory's information management system (LIMS). The resulting 20-30% stripped values (i.e. 70-80% adhering) indicate a 'fail' result. The technician notes that he has repeated the test and obtained the same 'fail' result. The laboratory manager reviews the results and asks the technician to explain how he performed the test. He describes how he prepared 3-4 mm thick plates of bitumen and binding agent in the mould and then placed 50 small clean pieces of aggregate on top. After treatment in an oven for 24

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	hours and a 50°C water bath in accordance with the test method, the technician had then carefully pulled out the pieces of aggregate and avoiding any twisting motion. He then estimated the % of bitumen adhering to each of the stones with the expectation that the stripped value would be about 5% (i.e. 95% adhering). The manager is satisfied that the technician has performed the test in accordance with the method and suggested that he now re-run the test with a known aggregate as a control. This test gives a stripped value of 5-7% (i.e. 93-95% adhering). The manager is now sufficiently confident of the laboratory's results to sign and issue the test report and explain the aggregate's 'test failure' to the client.

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.

Codes of practice

Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used

Standards, codes, procedures and/or enterprise requirements

Standards, codes, procedures and/or enterprise requirements may include:

- Australian and international standards, such as:
 - AS ISO 1000-1998 The international system of units (SI) and its application
 - AS ISO 17025-2005 General requirements for the competence of testing and calibration laboratories
 - AS/NZS 2243 Set:2006 Safety in laboratories set
- Australian code of good manufacturing practice for medicinal products (GMP)
- calibration and maintenance schedules

RANGE STATEMENT	
	• enterprise recording and reporting procedures • equipment manuals • equipment startup, operation and shutdown procedures • MSDS and safety procedures • material, production and product specifications • national measurement regulations and guidelines • principles of good laboratory practice (GLP) • production and laboratory schedules • quality manuals • standard operating procedures (SOPs)
Concepts of metrology	Concepts of metrology may include: • that all measurements are estimates • measurements belong to a population of measurements of the measured parameters • repeatability • precision • accuracy • significant figures • sources of error • uncertainty • traceability
Preparation of samples	Preparation of samples may include: • sub-sampling or splitting using procedures, such as riffing, coning and quartering, manual and mechanical splitters • diluting samples • physical treatments, such as ashing, dissolving, filtration, sieving, centrifugation and comminution • moulding, casting or cutting specimens
Typical tests carried out by laboratory/field assistants	Typical tests carried out by laboratory/field assistants may include: • visual/optical tests of appearance, colour, texture, identity, turbidity, refractive index (alcohol content and Baume/Brix) • physical tests: • density, specific gravity and compacted

RANGE STATEMENT	
	- density • moisture content and water activity • particle size, particle shape and size distribution • chemical tests: • gravimetric • colorimetric • electrical conductivity (EC) and pH • specific ions using dipsticks and kits • nutrients (e.g. nitrates and orthophosphates) using basic kits • ashes, including sulphated ashes • biological/environmental tests: • pH, oxygen reduction potential (ORP), dissolved oxygen (DO) and (EC) • E coli using test kits • surface hygiene/presence of microbes • packaging tests: • tearing resistance, bursting strength and impact resistance • permeability and/or leakage • mechanical tests: • Emerson class • concrete slump
Measurements	Measurements may include: • simple ground surveys • meteorological parameters, such as wind direction/strength, rainfall, maximum/minimum temperature, humidity and solar radiation • simple background radiation survey • production/process parameters, such as temperature, flow and pressure • gas levels in a confined space
Common measuring equipment	Common measuring equipment may include: • dimension apparatus • DO and EC • analogue and digital meters and charts/recorders

RANGE STATEMENT	
	• basic chemical and biological test kits • dipsticks and site test kits (e.g. HACK) • timing devices • temperature measuring devices, such as thermometers and thermocouples
Hazards	Hazards may include: • electric shock • biohazards, such as microbiological organisms and agents associated with soil, air, water, blood and blood products, and human or animal tissue and fluids • solar radiation, dust and noise • chemicals, such as sulphuric acid, fluorides and hydrocarbons • aerosols • sharps, broken glassware and hand tools • flammable liquids • dry ice and liquid nitrogen • fluids under pressure • sources of ignition • occupational overuse syndrome, slips, trips and falls • manual handling, working at heights and working in confined spaces • crushing, entanglement and cuts associated with moving machinery or falling objects
Enterprise controls to address hazards	Enterprise controls to address hazards may include: • use of MSDS • use of signage, barriers and service isolation tags • use of personal protective equipment, such as hard hats, hearing protection, sunscreen lotion, gloves, safety glasses, goggles, face guards, coveralls, gowns, body suits, respirators and safety boots • use of appropriate equipment, such as biohazard containers and cabinets and laminar flow cabinets • recognising and observing hazard warnings and safety signs

RANGE STATEMENT	
	• labelling of samples, reagents, aliquoted samples and hazardous materials • handling and storage of all hazardous materials and equipment in accordance with labelling, MSDS and manufacturer's instructions, and enterprise procedures and regulations • cleaning and decontaminating equipment and work areas regularly using recommended procedures • following established manual handling procedures for tasks involving manual handling
Minimising environmental impacts	Minimising environmental impacts may involve: • recycling of non-hazardous waste, such as chemicals, batteries, plastic, metals and glass • appropriate disposal of hazardous waste • correct disposal of excess sample/test material • correct storage and handling of hazardous chemicals
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Testing

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MSL976003A Evaluate and select appropriate test methods and/or procedures

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to evaluate and select test methods and/or procedures that are relevant to the current and evolving scope of the laboratory's operations. Selection of test methods and/or procedures may involve the appraisal of new and emerging technologies and may inform decision making about possible extension of the laboratory's scope. Alternatively, it may relate to existing testing requirements, 'one-off' tests, client's special requirements or new tests required to satisfy new legislative, accreditation, licensing or regulatory requirements.

Application of the Unit

Application of the unit	This unit of competency is applicable to senior technical officers, technical specialists and laboratory supervisors working in all industry sectors. They are required to demonstrate wide ranging, highly specialised technical skills. They are expected to execute sound judgement in the selection of appropriate methodology under the broad guidance of scientists/medical staff/engineers. All operations must comply with relevant standards, appropriate procedures and/or enterprise requirements. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These can be found at the end of this unit of competency under the section 'This competency in practice'.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine sample characteristics and testing requirements	1.1. Confirm drivers for evaluation and selection of test methods and/or procedures 1.2. Examine sample documentation and/or consult with sample supplier to determine nature of samples 1.3. Identify sample characteristics which may affect testing requirements 1.4. Determine testing requirements and their compatibility with existing standard operating procedures (SOPs)

ELEMENT	PERFORMANCE CRITERIA
2. Evaluate possible test methods and/or procedures	2.1. Identify appropriate standards, reference materials, test methods and/or procedures which may be applicable 2.2. Assess suitability of available standards, reference materials, test methods and/or procedures against testing requirements 2.3. Identify environmental and occupational health and safety (OHS) risks 2.4. Identify the need for specific equipment, instrumentation, and/or specialised facilities 2.5. Estimate materials, personnel and possible training requirements
3. Recommend appropriate test methods and/or procedures	3.1. Select appropriate test methodology consistent with testing requirements and resource availability 3.2. Identify any changes to SOPs required prior to implementation of selected method and/or procedure 3.3. Recommend selected method and/or procedure to appropriate personnel and seek authorisation to proceed
4. Confirm and document selected methods and/or procedures	4.1. Obtain standards and/or reference materials for the method and/or procedure 4.2. Conduct tests to verify the performance of the method and/or procedure, standards and reference materials 4.3. Analyse the measurements and estimate uncertainties 4.4. Determine if legal traceability is required and develop appropriate chain of custody procedures 4.5. Document all safety, sample preparation, testing, data handling and reporting procedures 4.6. Submit all documentation to appropriate personnel for review and approval

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:

- evaluating and selecting appropriate test methods and/or procedures to satisfy the range of testing situations normally encountered in the laboratory
- identifying reference standards or SOPs appropriate to testing requirements of the laboratory
- identifying standards that support compliance with regulatory and/or licensing requirements
- applying enterprise procedures to select appropriate standards
- using method performance analysis measures, such as accuracy, precision, uncertainty, linearity, selectivity, range, limit of detection and matrix characteristics in method selection
- documenting method selection procedures
- maintaining records of published methods
- following OHS procedures and principles of good laboratory practice (GLP)

Required knowledge

Required knowledge includes:

- principles, concepts and enterprise/regulatory requirements related to method selection
- regulatory/licensing testing requirements
- relative advantages/disadvantages of test methods for a range of testing situations
- cost advantages/disadvantages of enterprise test methods
- scientific/technical principles underpinning test method and their application to selection of testing methods for different materials
- metrological principles
- significance of normal, physiological or reference ranges
- enterprise and/or legal requirements for traceability
- enterprise/regulatory requirements regarding recording and reporting
- relevant health, safety and environment requirements

Specific industry

Additional knowledge requirements may apply for different industry sectors. For example:

Biomedical, biotechnology and food processing:

- effects of biologically inert or active chemicals, such as food and drug metabolites in test selection, testing and test data interpretation

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	Assessors should ensure that candidates can: • evaluate and select appropriate test methods and/or procedures to satisfy the range of testing situations normally encountered in the laboratory • identify reference standards or SOPs appropriate to testing requirements of the laboratory • identify standards that support compliance with regulatory and/or licensing requirements • apply enterprise procedures to select appropriate standards • use method performance measures, such as accuracy, precision, uncertainty, linearity, selectivity, range, limit of detection and matrix characteristics in method selection • clearly document method selection procedures • maintain records of published methods • follow OHS procedures and principles of GLP.
Context of and specific resources for assessment	This unit of competency is to be assessed in the workplace or simulated workplace environment. This unit of competency may be assessed with: • <i>MSL925002A Analyse measurements and estimate uncertainties</i> • <i>MSL916003A Supervise laboratory operations in work/functional area.</i> Resources may include: • standard laboratory equipped with appropriate equipment and reagents • SOPs and test methods • appropriate Australian and international regulatory standards.
Method of assessment	The following assessment methods are suggested: • completion of selection brief or selection proficiency test

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	• review of records completed by the candidate over a period of time to confirm consistency in method selection • feedback from peers and supervisors • oral questioning to establish basis of selection of test methods and/or procedures. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. 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. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case studies below to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. Biotechnology The choice of analytical method for protein assay is influenced by the amount of protein likely to be present and the impurities present. During an extraction procedure, the yield of protein is monitored. At any stage there will be a range of substances used in the extraction. When the extraction is complete and the protein required has been isolated, the amount of protein recovered could range from bulk or gram quantities down to microgram quantities. The technical officer will check through the available methodologies and select procedures that will take account of the above problems. The Biuret assay is used for bulk assay protein, but will require reagent blanks to compensate for the impurities. At later stages of the monitoring, the Bradford reagent will be chosen because of its greater sensitivity and detection of smaller concentrations. It will be chosen over the Folin's reagent because the Bradford reagent is not affected by buffer

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	reagents and detergent. Biomedical A technician is asked to detect, identify and quantify a blood group antibody using a range of physical, chemical and immunological tests. During the test evaluation and selection process he/she identifies performance parameters, such as test tolerance, sensitivity, specificity and reproducibility along with the effect of possible interfering serum pigments, such as dissolved haemoglobin and bilirubin. The technician prepares a report for the supervising scientist that explains the selection rationale, reports the performance test results and cites product information and recent literature to validate the test results and substantiate his/her conclusions and recommendations. Food processing A technician working in a food company must be able to select test methods appropriate to requirements. For example, if a quick determination of unsaturation in an oil mixture is required, the technician will probably use an appropriate method for determining the iodine value of the mix and compare this with specification. However, at a margarine manufacturing plant where the technician may be required to perform an analysis of fats and oils to determine the % saturated, % monounsaturated and % polyunsaturated components, then a gas chromatographic method would be run using appropriate computer software and the results checked against specification.

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.

Codes of practice

Where reference is made to industry codes of practice, and/or Australian/international standards,

RANGE STATEMENT	
	it is expected the latest version will be used
Standards, codes, procedures and/or enterprise requirements	Standards, codes, procedures and/or enterprise requirements may include: • Australian and international standards, such as: • AS ISO 1000-1998 The international system of units (SI) and its application • AS ISO 17025-2005 General requirements for the competence of testing and calibration laboratories • AS/NZS 2243 Set:2006 Safety in laboratories set • AS/NZS ISO 10005:2006 Quality management systems - Guidelines for quality plans • AS/NZS ISO 10012:2004 Measurement management systems - Requirements for measurement processes and measuring equipment • AS/NZS ISO 14000 Set:2005 Environmental management standards set • AS/NZS ISO 9000 Set:2008 Quality management systems set • ISO 5725 Accuracy (trueness and precision) of measurement methods and results • ISO/IEC Guide 98-3:2008 Uncertainty of measurement - Part 3 Guide to the expression of uncertainty in measurement (GUM) • Eurachem/CITAC Guide CG4 Quantifying uncertainty in analytical measurement • Australia New Zealand Food Standards (ANZFS) Code • Australian code of good manufacturing practice for medicinal products (GMP) • Australian Dangerous Goods Code • Australian Quarantine and Inspection Service (AQIS) Export Control (Orders) Regulations 1982 and Import Guidelines • ethics committee requirements • gene technology regulations • intellectual property and copy right

RANGE STATEMENT	
	• material safety data sheets (MSDS) • material, production and product specifications • National Association of Testing Authorities (NATA) Accreditation programs requirements • national environment protection measures • National Health and Medical Research Council (NHMRC) Guidelines • national measurement regulations and guidelines • OHS national standards and codes of practice • principles of GLP • quality manuals, equipment and procedures manuals • Therapeutic Goods Regulations 1009
Tests and procedures	Tests and procedures may be: • routine • infrequent • 'one-off' • quantitative or qualitative • identification or quantification of biological, chemical or physical activity • gross characteristics of a sample, including in vitro and in vivo • detection of chemical, physical or biological characteristics, features, markers or responses
Drivers for the evaluation and selection of test methods and/or procedures	Drivers for the evaluation and selection of test methods and/or procedures may include the: • new or amended legislation, regulation and licensing, accreditation requirements • public, political and commercial pressures • 'one-off' testing of potentially hazardous or contaminated materials following an environmental emergency or incident • introduction of new reference standards, new or modified equipment and instruments • introduction of commercial products that are potentially hazardous • control of new, or changed, starting materials, in-process materials and products • troubleshooting of production, environmental and public health issues

RANGE STATEMENT	
	• environmental monitoring of new sites • investigation of customer's complaints • specialised testing of forensic, medical or veterinary samples • need to meet customer specific or changed requirements • development of new products
Factors which may influence method evaluation and selection	Factors which may influence method evaluation and selection • quantity and nature of sample available for testing • levels of detection required • type of matrix, possible contaminants and resulting interference • safety • availability of suitable equipment, instruments and availability of trained staff • cost • selectivity of method, range, accuracy, precision and acceptable uncertainty • whether it is appropriate/ethical to perform the test • balancing customer, enterprise and/or regulatory/licensing requirements
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Testing

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MSL977001A Contribute to the development of products and applications

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to evaluate a product/application brief and to contribute to the development of products and applications to meet the requirements of the brief.

Application of the Unit

Application of the unit	This unit of competency is applicable to senior technical officers, laboratory supervisors and technical specialists working in all industry sectors. All operations must comply with relevant standards, appropriate procedures and/or enterprise requirements Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These can be found at the end of this unit of competency under the section 'This competency in practice'.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Prerequisite units		
	MSL976003A	<i>Evaluate and select appropriate test methods and/or procedures</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Scope the development project	1.1. Confirm details of new product/application brief 1.2. Specify new product/application requirements 1.3. Analyse existing products (internal and external to enterprise) to determine if they meet customer need 1.4. Interpret and apply relevant Acts, regulations and codes of practice 1.5. Prepare product development plan 1.6. Obtain approval for development plan from appropriate personnel
2. Set scope of project	2.1. Estimate resource requirements, including staffing, equipment and materials needed to undertake the project 2.2. Identify roles and responsibilities of project team

ELEMENT	PERFORMANCE CRITERIA
	members 2.3. Identify quality requirements and quality standards 2.4. Prepare project timelines taking into account any constraints
3. Develop new product formulation	3.1. Prepare documentation for new product pilot batch 3.2. Evaluate/recommend materials for new product/application 3.3. Calculate required quantities of materials and adjust for properties as appropriate 3.4. Develop/modify products in pilot batch scale in accordance with enterprise and regulatory requirements 3.5. Arrange for product evaluation against development brief 3.6. Modify product/application to meet evaluation recommendations 3.7. Edit documentation and issue to appropriate personnel 3.8. Recommend and evaluate packaging for new product/application 3.9. Prepare protocol for stability (shelf) testing of new product/application
4. Assist in preparation of quality/regulatory compliance procedures/materials	4.1. Develop in-process and laboratory testing protocols 4.2. Prepare product labelling and submit for approval 4.3. Assist in product and analytical method validation 4.4. Implement an effective plant hygiene and asepsis program, if applicable 4.5. Develop good manufacturing principles for medicinal products (GMP)/principles of good laboratory practice (GLP) protocols for approval by appropriate personnel 4.6. Prepare standard operating procedures (SOPs) for quality and laboratory related procedures 4.7. Prepare occupational health and safety (OHS) procedures for the laboratory and manufacturing environment and submit for approval
5. Document and report project outcomes	5.1. Document and report project outcomes 5.2. Complete project reporting requirements

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 and explaining sections of legislation, codes, regulations and Australian standards that apply to the tasks undertaken in developing products and applications
- evaluating a product/application brief and contributing to the development of products and applications to meet the requirements of the brief
- interpreting a brief to determine product/application development requirements
- applying theoretical knowledge of starting material and formulation principles to develop product/applications
- using appropriate procedures to research alternative formulations
- using environment friendly strategies for formulations
- making formulation recommendations for pilot batch manufacture
- manufacturing pilot batches
- evaluating pilot batches against project brief
- evaluating product/application stability
- evaluating the OHS requirements to be observed for each ingredient during manufacture of product/application
- evaluating the OHS suitability of each ingredient for use in the formulation
- ensuring that product/application meets regulatory requirements
- following enterprise procedures to document development process

Required knowledge

Required knowledge includes:

- theoretical and practical aspects of product/application development
- physical and chemical aspects of product/application development
- principles and practices of operation of a range of pilot batch equipment
- uses, characteristics and limitations of formulation starting materials
- formulation development procedures
- performance outcomes expected and key indicators
- enterprise and regulatory development, quality and stability testing requirements
- business goals and the impact of their projects on these goals
- operating budgets and plans for work area
- relevant health, safety and environment requirements

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

Assessors should ensure that candidates can:

- evaluate a product/application brief and contribute to the development of products and applications to meet the requirements of the brief
- interpret a brief to determine product/application development requirements
- apply theoretical knowledge of starting material and formulation principles to develop product/applications
- use appropriate procedures to research alternative formulations
- use environment friendly strategies for formulations
- make formulation recommendations for pilot batch manufacture
- manufacture pilot batches
- evaluate pilot batches against project brief
- evaluate product/application stability
- evaluate the OHS requirements to be observed for each ingredient during manufacture of product/application
- evaluate the OHS suitability of each ingredient for use in the formulation
- ensure that product/application meets regulatory requirements
- follow enterprise procedures to document development process.

Context of and specific resources for assessment

This unit of competency is to be assessed in the workplace or simulated workplace environment.

This unit of competency may be assessed with:

- *MSL977002A Troubleshoot equipment and/or production processes*
- *MSL977003A Contribute to the validation of test methods*
- *MSL977004A Develop or adapt analyses and*

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	<i>procedures.</i> Resources may include: • standard laboratory equipped with appropriate pilot batch manufacturing and testing equipment • online data search facilities • starting material and product formulation information • scheduling charts and project plans • appropriate SOPs and enterprise guidelines.
Method of assessment	The following assessment methods are suggested: • review of development work completed by the candidate • review of development briefs completed by the candidate over time to ensure that they were implemented consistently within the required timeframe • feedback from supervisors and/or clients • oral or written questioning to assess development and problem solving approaches. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. 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. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case studies below to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. Manufacturing Technical specialists who formulate cosmetics products must apply theoretical and practical knowledge during each stage of the formulation process. This is illustrated

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during the perfuming stage of the product development process for a product range consisting of soap, talc and a water-in-oil emulsion. For example, soaps are alkaline and the selected perfume must be stable under alkaline conditions. Perfumes consist of a large number of components, and any preferential adsorption of some of these components on the surface of the talc will alter the odour. When perfuming an emulsion, the components of the perfume will partition between the water and oil phases of the emulsion, altering the odour reaching the consumer. To get the three products smelling the same after manufacture requires attention to these theoretical concepts. Stability studies must be planned and carried out to ensure that the products are stable in the chosen packs and smell the same throughout their lifetime. When perfuming this rather small range of products, the technical specialists must apply a wide range of theoretical and practical knowledge to satisfy the product brief.

Food processing

Technical specialists in food research laboratories evaluate product briefs provided by marketing. They then develop products to meet the requirements of the brief and convert the brief into a marketable product. After the product is successfully introduced, technical specialists must continue to upgrade the quality and desirability of products because of shortened product life cycles.

As part of their role technical specialists may be required to apply technical knowledge to:

- reduce ingredient costs of existing formulation
- standardise existing formulations and processes for quality and cost control
- identify solutions to existing problems, such as product quality or shelf life
- develop consumer preparation instruction methods
- develop labelling or packaging information
- formulate new or improve existing products
- locate and evaluate new packaging alternatives to meet a range of requirements
- assist in compliance with regulatory standards
- assess consumer preferences
- prepare pilot batches of new products
- assist in scale up of pilot batches to full scale

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	production batches • test product's shelf life. This requires an in-depth knowledge of how to select and use various ingredients for specific applications, as well as the chemistry, technology and regulatory aspects of their job.

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.

Codes of practice

Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used

Standards, codes, procedures and/or enterprise requirements

Standards, codes, procedures and/or enterprise requirements may include:

- Australian and international standards, such as:
 - AS ISO 17025-2005 General requirements for the competence of testing and calibration laboratories
 - AS/NZS 2243 Set:2006 Safety in laboratories set
- AS/NZS ISO 10005:2006 Quality management systems - Guidelines for quality plans
- AS/NZS ISO 10012:2004 Measurement management systems - Requirements for measurement processes and measuring equipment
- AS/NZS ISO 9000 Set:2008 Quality management systems set

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- ISO 5725 Accuracy (trueness and precision) of measurement methods and results
- ISO/IEC Guide 98-3:2008 Uncertainty of measurement - Part 3 Guide to the expression of uncertainty in measurement (GUM)
- Eurachem/CITAC Guide CG4 Quantifying uncertainty in analytical measurement
- Australia New Zealand Food Standards (ANZFS) Code
- Association of Analytical Communities International (AOAC International) Official methods of analysis
- ICH Q2A: Validation of Analytical Procedures - Guideline for industry
- Australian code of good manufacturing practice for medicinal products (GMP)
- Australian Quarantine and Inspection Service (AQIS) Export Control (Orders) Regulations 1982 and Import Guidelines
- calibration and maintenance schedules
- enterprise recording and reporting procedures
- equipment and quality manuals
- gene technology regulations
- intellectual property and copyright
- maintenance and confidentiality of records
- material safety data sheets (MSDS)
- material, production and product specifications
- national environment protection measures
- National Health and Medical Research Council (NHMRC) Guidelines
- national measurement regulations and guidelines
- OHS national standards and codes of practice
- principles of good laboratory practice (GLP)
- product formulation documentation
- SOPs
- suppliers of raw material catalogues
- Therapeutic Goods Regulations 1009

RANGE STATEMENT	
Product/application briefs	Product/application briefs may be provided by: • external customers • internal customers • marketing • production
Materials used to manufacture products/applications	Materials used to manufacture products/applications may include: • solvents • emulsifiers • thickeners • surfactants • disintegrants • fillers • moisturising materials • colouring materials • flavours • perfumes • opacifiers • propellants • sunscreens
Calculations	• Calculations may be required to adjust properties, such as: • assay/potency • viscosity • application payload • hardness • moisture content • colour
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied

RANGE STATEMENT	
	where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Testing

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MSL977002A Troubleshoot equipment and/or production processes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers ability to apply technical, instrumental and equipment knowledge and skills to troubleshoot testing equipment and testing issues related to production processes, identify problems and recommend corrective action.

Application of the Unit

Application of the unit	This unit of competency is applicable to senior technical officers, laboratory supervisors and technical specialists working in all industry sectors. All operations must comply with relevant standards, appropriate procedures and/or enterprise requirements. Troubleshooting is the process of using technical knowledge and skills to investigate abnormal performance and assay results. This unit of competency includes troubleshooting testing equipment and testing issues related to production processes. In the case of chromatography, for example, these problems may be related to materials, such as laboratory solvents, procedures or equipment components, such as columns, injectors, pumps and detectors. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These can be found at the end of this unit of competency under the section 'This competency in practice'.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
	MSL976003A	<i>Evaluate and select appropriate test methods and/or procedures</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify abnormal equipment and/or process performance	1.1. Determine whether testing equipment is operating to manufacturer's specifications 1.2. Recognise whether equipment outputs are consistent with normal operation 1.3. Identify signs of equipment degradation and impending failure 1.4. Inspect equipment outputs to determine nature of the problem 1.5. Define nature of substandard performance
2. Identify causes of	2.1. Select appropriate technical process for

ELEMENT	PERFORMANCE CRITERIA
substandard performance	investigation 2.2. Identify causes using fact-finding processes, including interviews with appropriate personnel 2.3. Review maintenance records to ensure that system doesn't need simple maintenance 2.4. Review calibration records to ensure system is within calibration 2.5. Verify that the appropriate test procedure, materials and equipment were used 2.6. Conduct performance tests as appropriate to investigation 2.7. Analyse equipment and/or testing variables to develop list of possible causes 2.8. Isolate causes using appropriate elimination techniques
3. Recommend corrective action	3.1. Propose and trial corrective action based on investigation 3.2. Monitor trial data to ensure outputs are consistent with normal operation 3.3. Review trial results to confirm validity of corrective action 3.4. Maintain workplace records as required 3.5. Submit report summarising investigation and recommendations

Required Skills and Knowledge

Required skills include:

- troubleshooting testing equipment and testing issues related to production processes
- identifying causes of faulty or substandard performance
- proposing adjustments/rectifications/modifications
- testing results of adjustments/rectifications/modifications
- locating, interpreting and applying relevant information
- maintaining relevant workplace records
- identifying and safely handling products and materials
- applying safety precautions appropriate to the task

Required knowledge

Required knowledge includes:

- theoretical and practical aspects of laboratory equipment and processes
- principles and procedures of testing equipment operation
- characteristics, capabilities and limitations of testing equipment and its components
- troubleshooting procedures for testing equipment
- possible effects of matrix and impurities on analytical method
- troubleshooting procedures for production processes
- regulatory and licensing/testing requirements
- mathematical/statistical procedures for evaluation of test data
- enterprise requirements for problem investigation and reporting
- relevant health, safety and environment requirements

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

Assessors should ensure that candidates can:

- troubleshoot testing equipment and testing issues related to production processes to identify causes of problems and recommend corrective action
- identify causes of faulty or substandard performance
- propose adjustments/ rectifications/ modifications
- test results of adjustments/rectifications/modifications
- locate, interpret and apply relevant information
- maintain relevant workplace records
- identify and safely handle products and materials
- apply safety precautions appropriate to the task.

Context of and specific resources for assessment

This unit of competency is to be assessed in the workplace or simulated workplace environment.

This unit of competency may be assessed with:

- *MSL977001A Contribute to development of products and applications*
- *MSL977003A Contribute to validation of test*

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	<i>methods.</i> • <i>MSL977004A Develop or adapt analyses and procedures.</i> Resources may include: • standard laboratory equipped with appropriate equipment, samples, reagents and test methods • laboratory procedures and SOPs.
Method of assessment	The following assessment methods are suggested: • completion of a troubleshooting brief or a troubleshooting proficiency test • review of workplace troubleshooting briefs completed by the candidate • feedback from supervisors and/or clients • oral or written questioning to assess underpinning knowledge of equipment operation, troubleshooting procedures and problem solving techniques • simulated equipment failure scenarios. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. 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. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case studies below to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. Manufacturing Emission spectroscopy is a technique often used by technicians to troubleshoot problems resulting from contamination. For example, a sample of stainless steel that showed signs of corrosion was submitted to a

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chemical technician for analysis. The technician subjected the sample to a spark and compared the spectra of the composite steel to spectra of a control sample of stainless steel. The technician concluded that the vanadium concentration in the sample was higher than that of the control sample. After doublechecking the work, the technician passed the results back to the engineering staff who were able to find the source of error and correct the manufacturing problem.

Biomedical

The immuno-analyser has become non-functional. The senior technical officer notifies the laboratory manager and then checks out the instruction sequence for that assay, checks the diagnostics for the detection unit, and reagent and sample lines, and then runs the diagnostic check program provided by the company. The officer concludes that the fault is due to instrument failure.

Food processing

A food company received a large number of customer complaints regarding the taste of its flavoured yoghurt product. The technician asked their sales representative to collect samples of the product from sales outlets while she/he collected retained reference samples with the same batch number/expiry date for examination. The technician developed a strategy for troubleshooting the production process and followed the following steps:

- analysis of the returned product and reference samples indicated that the sugar concentration was above specification in both, suggesting that an error occurred during manufacturing or packaging
- examination of batching sheets with the appropriate product code indicated that the correct formula and quantities of raw materials were used
- retention samples were re-analysed and indicated that all were within specification
- discussions with operators did not uncover any cause for the defect
- observation of the process indicated that a non-standard batching drum was being used
- discussions with the operator revealed that the tared standard drum used for weighing raw materials had been damaged and a lighter non-standard drum was being used with the original tare weight.

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	Analysis of the sugar content in the yoghurt indicated that the increased sugar content was due to the incorrect tare weight.

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.

Codes of practice

Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used

Standards, codes, procedures and/or enterprise requirements

Standards, codes, procedures and/or enterprise requirements may include:

- Australian and international standards, such as:
- AS ISO 1000-1998 The international system of units (SI) and its application
 - AS ISO 17025-2005 General requirements for the competence of testing and calibration laboratories
 - AS/NZS 2243 Set:2006 Safety in laboratories set
- AS/NZS ISO 10005:2006 Quality management systems - Guidelines for quality plans
- AS/NZS ISO 10012:2004 Measurement management systems - Requirements for measurement processes and measuring equipment
 - AS/NZS ISO 14000 Set:2005 Environmental management standards set
 - AS/NZS ISO 9000 Set:2008 Quality management systems set
 - ISO 5725 Accuracy (trueness and precision) of measurement methods and

RANGE STATEMENT	
	results • ISO/IEC Guide 98-3:2008 Uncertainty of measurement - Part 3 Guide to the expression of uncertainty in measurement (GUM) • Eurachem/CITAC Guide CG4 Quantifying uncertainty in analytical measurement • Australia New Zealand Food Standards (ANZFS) Code • Australian code of good manufacturing practice for medicinal products (GMP) • calibration and maintenance schedules • enterprise recording and reporting procedures • equipment startup, operation and shutdown procedures • gene technology regulations • material safety data sheets (MSDS) • material, production and product specifications • National Association of Testing Authorities (NATA) Accreditation programs requirements • National Health and Medical Research Council (NHMRC) Guidelines • national measurement regulations and guidelines • occupational health and safety (OHS) national standards and codes of practice • principles of good laboratory practice (GLP) • production and laboratory schedules • quality manuals, equipment and procedures manuals • standard operating procedures (SOPs) • Therapeutic Goods Regulations 1009
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard

RANGE STATEMENT

	precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Unit sector	Testing

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MSL977004A Develop or adapt analyses and procedures

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to develop or adapt analyses and procedures to meet enterprise and/or regulatory requirements. New analyses and associated procedures may be required to meet a customer's brief, analyse new products or raw materials, improve laboratory efficiency or meet changing regulatory requirements.

Application of the Unit

Application of the unit	This unit of competency is applicable to senior technical officers, laboratory supervisors and technical specialists working in all industry sectors. All operations must comply with relevant standards, appropriate procedures and/or enterprise requirements. The work may involve developing new testing methods or adapting existing methods to satisfy a testing need. Industry representatives have provided case studies to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. These can be found at the end of this unit of competency under the section 'This competency in practice'.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
	MSL976003A	<i>Evaluate and select appropriate test methods and/or procedures</i>

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine gaps and deficiencies in present analyses and/or procedures	1.1. Identify opportunities to improve analyses and/or procedures 1.2. Identify requirements for new analyses and procedures to meet testing briefs 1.3. Define the scope of analysis required by the improvement or new testing brief 1.4. Establish that existing enterprise test methods/procedures do not meet requirements 1.5. Prepare development proposal 1.6. Confirm development requirements and development proposal with appropriate personnel 1.7. Obtain authorisation to proceed

ELEMENT	PERFORMANCE CRITERIA
2. Research and propose alternatives	2.1. Source relevant documented methods/procedures 2.2. Review relevant documented methods/procedures according to enterprise procedures 2.3. Consult with relevant technical personnel regarding project development issues 2.4. Evaluate resource requirements for proposed methods/procedures 2.5. Ensure that methods/procedures meet occupational health and safety (OHS), environmental, regulatory and enterprise requirements 2.6. Document development requirements, timelines and proposed methods/procedures 2.7. Obtain authorisation to proceed
3. Evaluate alternatives, develop analyses and recommend methods and procedures	3.1. Investigate possible alternative methods and procedures and choose appropriate method/procedure 3.2. Develop and/or adapt analytical method or test procedure to meet requirements 3.3. Trial method/procedure against test method/procedure requirements 3.4. Validate method/procedure 3.5. Maintain records to substantiate and justify chosen method/procedure
4. Document and report new method/procedure	4.1. Prepare and/or update analytical method/procedure and associated standard operating procedures (SOPs) 4.2. Obtain final approval for new method/procedure 4.3. Withdraw, document and archive superseded method/procedure 4.4. Issue new method/procedure according to enterprise procedures

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

- developing or adapting analyses and procedures to meet requirements
- interpreting a brief to determine testing requirements
- applying theoretical concepts and practical principles to develop or adapt methods
- evaluating existing testing procedures against new testing requirements
- using method performance analysis measures, such as accuracy, precision, uncertainty, linearity, selectivity, range, limit of detection and matrix characteristics
- researching alternative methods
- making recommendations for modification of existing procedures or development of new procedures
- following enterprise procedures to document and circulate new procedures

Required knowledge

Required knowledge includes:

- detailed knowledge of theoretical and practical basis of test/analysis
- principles and practices of operation of a range of testing equipment
- characteristics, capabilities and limitations of equipment
- relative advantages/disadvantages of different analytical methods
- theoretical procedures for method development
- method validation requirements
- enterprise and regulatory testing requirements
- relevant health, safety and environment requirements

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**

Assessors should ensure that candidates can:

- develop or adapt analyses and procedures to meet requirements
- interpret a brief to determine testing requirements
- apply theoretical concepts and practical principles to develop or adapt methods to meet requirements
- evaluate existing testing procedures against new

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	testing requirements • use appropriate procedures to research alternative methods • use method performance measures, such as accuracy, precision, uncertainty, linearity, selectivity, range, limit of detection and matrix characteristics • make recommendations for modification of existing procedures or development of new procedures based on sound principles • follow enterprise procedures to document and circulate new procedures.
Context of and specific resources for assessment	This unit of competency is to be assessed in the workplace or simulated workplace environment. This unit of competency may be assessed with: • <i>MSL925002A Analyse measurements and estimate uncertainties</i> • <i>MSL977001A Contribute to the development of products and applications</i> • <i>MSL977002A Troubleshoot equipment and production processes</i> • <i>MSL977003A Contribute to validation of test methods.</i> Resources may include: • standard laboratory equipped with appropriate equipment, reagents, samples and test methods • online data search facilities.
Method of assessment	The following assessment methods are suggested: • review of development or adaptation of methods completed by the candidate • review of workplace development briefs completed by the candidate • feedback from supervisors and/or clients • oral or written questioning to assess underpinning knowledge of analyses, instrument operation, procedures and problem solving techniques. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly Where applicable, reasonable adjustment must be made

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	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. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work like environment.
This competency in practice	Industry representatives have provided the case studies below to illustrate the practical application of this unit of competency and to show its relevance in a workplace setting. Manufacturing Technical specialists often have to apply their practical and theoretical knowledge of laboratory instrumentation to adapt or develop methods to solve specific problems. For example, a technical specialist in a consulting laboratory was asked to determine why heat-sealing bags were not sealing properly. Using infrared spectroscopy, the specialist ran spectra on several samples and noticed a difference in the coating on the bags which didn't seal compared with the coating on bags which sealed correctly. The spectra indicated that the coatings were different polymers. The technical specialist notified the supplier of the sealing problem and new bags were forwarded. To ensure that the problem didn't occur again, an infrared spectroscopy test method was developed to ensure that the correct polymer coating was on the new bags. As a result, production flowed smoothly when bags were delivered to the production line. Biomedical A laboratory manager determined that there is sufficient demand for a particular enzyme activity assay. Currently, this assay is performed manually by kinetic assay using a spectrometer. A senior technical officer has been given the task of converting the method to one that can be run on an automated biochemical analyser. The method will be translated to instructions regarding wavelength, absorbance increase or decrease, time of reading and intervals of the readings, sequence of addition of the reagents and sample, ratio of the volumes (they will be reduced in the automated procedure) and incubation

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	conditions. Food processing The water activity of food is affected by temperature. The measurement of water activity takes considerable time, due in part to the time required for the sample to reach the specified test temperature in the instrument. A technician suggested that the test time could be reduced if the samples were presented to the instrument at the test temperature, rather than room temperature. She/he also raised concerns about water loss which could occur while raising the sample to test temperature. The technician planned an investigation and ran tests using standard Greenspan salts to compare results from normal testing with testing using pre-warm samples. Pre-warm samples held for 30 minutes in a pre-warm cabinet gave different results from the normal test method samples. However, samples held for 15 minutes in the pre-warm cabinet did not. A test method was subsequently introduced with samples being held for a maximum of 10 minutes in a pre-warm cabinet prior to being loaded into the water activity instrument. This gave excellent statistical correlation with the normal method and provided increased throughput of samples.

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.

Codes of practice

Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used

Standards, codes, procedures and/or enterprise requirements

Standards, codes, procedures and/or enterprise requirements may include:

- Australian and international standards, such as:

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- AS ISO 1000-1998 The international system of units (SI) and its application
- AS ISO 17025-2005 General requirements for the competence of testing and calibration laboratories
- AS/NZS ISO 10005:2006 Quality management systems - Guidelines for quality plans
- AS/NZS ISO 10012:2004 Measurement management systems - Requirements for measurement processes and measuring equipment
- AS/NZS ISO 14000 Set:2005 Environmental management standards set
- AS/NZS ISO 9000 Set:2008 Quality management systems set
- ISO 5725 Accuracy (trueness and precision) of measurement methods and results
- ISO/IEC Guide 98-3:2008 Uncertainty of measurement - Part 3 Guide to the expression of uncertainty in measurement (GUM)
- Eurachem/CITAC Guide CG4 Quantifying uncertainty in analytical measurement
- appropriate journals and Internet sites
- Australia New Zealand Food Standards (ANZFS) Code
- Australian code of good manufacturing practice for medicinal products (GMP)
- Australian Quarantine and Inspection Service (AQIS) Export Control (Orders) Regulations 1982 and Import Guidelines
- calibration and maintenance schedules
- enterprise recording and reporting procedures
- ethics committee requirements
- gene technology regulations
- intellectual property and copy right
- material safety data sheets (MSDS)
- material, production and product specifications
- National Association of Testing Authorities (NATA) Accreditation programs requirements

RANGE STATEMENT	
	• national environment protection measures • National Health and Medical Research Council (NHMRC) Guidelines • national measurement regulations and guidelines • OHS national standards and codes of practice • principles of good laboratory practice (GLP) • production and laboratory schedules • quality manuals, equipment and procedures manuals • Therapeutic Goods Regulations 1009
New methods of analysis and related procedures	New methods of analysis and related procedures may be required to: • analyse raw materials • quality control or evaluate the stability of products • quality control or evaluate the stability of new formulations of existing products • use new technology • meet regulatory requirements • meet customer requirements • improve productivity • improve accuracy and precision
Analyses	Analyses may include: • non-instrumental methods, such as gravimetric, titrimetric and qualitative tests • spectrometric methods, such as ultraviolet-visible (UV-VIS), infra red (IR) (including fourier transform infra red (FTIR)), near infra red (NIR), atomic absorption (AA) and fluorescence • chromatographic methods, such as thin layer, paper, gas chromatography (GC), high performance liquid chromatography (HPLC), ion chromatography (IC) and electrophoresis • electrochemical methods, such as ion-selective electrodes and polarography • assays based on biological properties or cell properties for enzyme antibody activity
Procedures	Procedures are:

RANGE STATEMENT	
	• directions for conducting analyses • hard copy • online format
Concepts relating to method development	Concepts relating to method development include: • determining and defining development objectives • relating chemical and physical characteristic of sample to possible assay methods • evaluating criteria to choose appropriate analytical method • sample cleanup and preparation techniques • preparation, setup and calibration of testing equipment • choice of appropriate detection system ensuring accuracy/precision criteria are achieved • optimisation of analysis conditions • generating, recording and reporting data in format which assists procedure writing
Criteria for choice of method	Criteria for choice of method may include: • economic factors • safety considerations • resource factors, including equipment and personnel • regulatory, accreditation and registration considerations
Occupational health and safety (OHS) and environmental management requirements	OHS and environmental management requirements: • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and

RANGE STATEMENT

	State and Territory Departments of Health

Unit Sector(s)

Unit sector	Testing

Competency field

Competency field	

Co-requisite units

Co-requisite units		

NWP357B Monitor, operate and control reverse osmosis and nano-filtration processes

Modification History

NWP357B Release 2: Layout and adjusted. No changes to content.

NWP357B Release 1: Primary release.

Unit Descriptor

This unit of competency describes the outcomes required to monitor, operate and control reverse osmosis (RO) and/or nano-filtration (NF) plant; and to measure and report on system performance and process quality control. The ability to identify faults, determine and apply technical adjustments and produce technical reports are essential to performance.

Application of the Unit

This unit supports the attainment of skills and knowledge required for operational staff with a specific responsibility for ensuring that reverse osmosis and/or nano-filtration processes in treatment plants conform to organisational standards and comply with statutory 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 a unit of competency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Where <i>bold italicised</i> 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 Monitor RO and/or NF processes.	1.1 Monitor test results and processes to maintain the parameters of operation. 1.2 Identify and report process faults and the operational condition of plant according to organisational and statutory requirements .
2 Operate and control RO and/or NF processes.	2.1 Carry out routine plant inspections according to organisational and plant requirements. 2.2 Conduct and analyse process tests and compare performance to plant operational requirements. 2.3 Make integrated process adjustments to optimise system performance according to organisational and statutory requirements. 2.4 Collect, interpret and record process according to organisational and plant requirements. 2.5 Correctly select, fit and use required safety equipment, including personal protective equipment.
3 Compile process reports.	3.1 Compile reports from plant and system data to meet organisational procedures and statutory requirements. 3.2 Report observations outside defined parameters for further action.

Required Skills and Knowledge

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

Required skills:

- solve operational problems
- produce reports and logs
- use safety and personal protective equipment
- interpret plans, charts and instructions
- interpret policies, procedures and standards
- communicate with employees and customers
- use communication equipment
- give and receive instructions
- determine chemical dosing requirements
- perform system calculations
- operate control equipment
- identify control system faults
- perform system calculations
- collect samples and perform tests

Required knowledge:

- system layout
- system processes
- lock out procedures for mechanical and electrical installations
- policies, procedures and legislation
- relevant utilities and service bodies
- communication systems
- hazardous materials handling
- interpretation of material safety data sheets
- principles that form the basis of reverse osmosis and nano-filtration processes
- risk factors and potential hazards
- equipment operation, capacity and limitations
- pipes and fittings
- pumping and valving systems
- mechanical and electrical control systems

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 for assessment and evidence required to demonstrate competency in this unit

The candidate should demonstrate the ability to monitor, operate and control reverse osmosis and nano-filtration processes, including:

- monitoring test results and processes
- identifying and reporting faults
- conducting routine plant inspections
- taking samples and performing basic tests
- making basic process adjustments according to instructions
- collecting data and completing required documentation

Context of and specific resources for assessment

Access to the workplace and resources including:

- documentation that should normally be available in a water industry organisation
- relevant codes, standards and government regulations

Where applicable, physical resources should include equipment modified for people with disabilities.

Access must be provided to appropriate learning and/or assessment support when required.

Assessment processes and techniques must be culturally appropriate, and appropriate to the language and literacy capacity of the candidate and the work being performed.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice
- a decision of competence only taken at the point when the assessor has complete confidence in the person's competence over time and in various contexts
- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence
- where assessment is for the purpose of recognition (RCC/RPL), the evidence provided will need to be authenticated and show that it represents competency demonstrated over a period of time
- assessment can be through simulated project-based activity and must include evidence relating to each of the elements in this unit

Questioning will be undertaken in a manner appropriate to the skill levels of the operator, any cultural issues that may affect responses to the questions, and reflecting the requirements of the competency 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. 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.

Processes may include:

- pre-treatment, for example
 - screening
 - scaling chemicals
- reverse osmosis, for example:
 - desalination
 - demineralisation

- Organisational and statutory requirements** may include:
- nano-filtration, for example:
 - desalination
 - demineralisation
 - by-laws and organisational policies
 - standard operating procedures
 - environment protection
 - occupational health and safety, including use of personal protective equipment
 - chemicals
 - dangerous goods
 - electrical
 - lifts and cranes
 - World Health Organisation standards
 - Australian Drinking Water Guidelines
 - National Water Quality Management strategy
 - licensing agreements
- Routine plant inspection** may include:
- use of equipment, including:
 - electronic monitoring and metering systems
 - chart recording systems
 - basic hand tools
 - sampling and laboratory testing equipment
 - computerised equipment
 - personal protective equipment
 - interaction and communication with other employees, other authorities and the general public
 - visual observation
 - implementation of reporting procedures that may also include procedures for the implementation of by-laws, organisational policies and statutory requirements
- Tests** may include:
- electrical conductivity
 - total dissolved solids
 - pH
 - temperature
 - turbidity
 - pressure
 - silt density index
 - scaling potential
- Process adjustments** may include:
- pH control
 - chemical cleaning
 - pre-treatment optimisation
 - flow control

Reports may include:

- waste disposal
- organisational reports
- environmental reports
- plant performance data

Unit Sector(s)

Not applicable.

Competency field

Treatment.

PSPGOV308B Work effectively with diversity

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 the competency for individuals without supervisory responsibilities to work effectively with diversity. It includes recognising and valuing individual differences and working effectively with diverse clients and colleagues.

In practice, working with diversity is demonstrated in the context of other generalist or specialist work activities such as working effectively in the organisation, upholding the values of public service, contributing to the workgroup, delivering client services, procuring goods or services, etc.

This is one of 6 units of competency in the Competency Fields of *Working in Government* and *Management* that deal with diversity. Related units are:

- PSPGOV201B Work in a public sector environment
- PSPGOV408A Value diversity
- PSPGOV505A Promote diversity
- PSPMNGT605B Manage diversity
- PSPMNGT702A Influence and shape diversity management

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. Recognise and value individual differences	1.1 Workgroup <i>diversity</i> is explored to identify attributes that may be of benefit to the organisation and its client base. 1.2 <i>Colleagues</i> are assisted to acknowledge and use their diverse attributes to contribute to workgroup processes, outcomes and delivery of services to diverse clients. 1.3 Own work practices are used to acknowledge and reflect the diversity of self and colleagues for the benefit of workplace activities, stakeholder relationships and outcomes. 1.4 Client diversity is identified and responded to in accordance with <i>legislation, policy and guidelines</i>.
2. Work effectively with diverse clients and colleagues	2.1 A range of communication styles is developed and used to respect and reflect the diversity of the workplace and client groups. 2.2 Compliance with the requirements of public sector legislation, policies and guidelines relating to workplace diversity is demonstrated through personal conduct in the workplace. 2.3 Feedback from clients and the workgroup is sought and utilised to continuously improve personal effectiveness in working with diversity.

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:

- using a range of communication styles to suit different audiences and purposes
- communicating with people from diverse backgrounds
- responding to diversity, including gender and disability
- reading complex and formal documents such as legislation and codes of conduct and applying them to work practices
- accessing legislation and codes of conduct electronically or in hard copy

Knowledge requirements

Look for evidence that confirms knowledge and understanding of:

- cultural diversity, including issues of racism, harassment and victimisation
- direct and indirect discrimination, such as dress codes that exclude certain groups (eg requiring male staff to be clean shaven would indirectly discriminate against Sikhs)
- own cultural assumptions and their effect on behaviour and work practices
- public sector definitions of diversity
- the benefits of workplace diversity
- ways to ensure effective and equitable delivery of services to diverse clients
- equal employment opportunity, equity and diversity principles
- principles and practices of cultural awareness and cross-cultural communication
- public sector values and codes of conduct
- public sector legislation impacting on workplace diversity
- organisational policies and procedures

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:

- PSPETHC301B Uphold the values and principles of public service
- PSPGOV301B Work effectively in the organisation
- PSPGOV302B Contribute to workgroup activities
- PSPGOV309A Address client needs
- PSPGOV310A Work in and with small, regional and remote organisations
- PSPGOV312A Use workplace communication strategies
- PSPGOV314A Contribute to conflict management
- PSPGOV315A Give and receive workplace feedback
- PSPLEGN301B Comply with legislation in the public sector

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 Employability Skills as they relate to this unit
- working effectively with diversity in a range of (3 or more) contexts (or occasions, over time)

Resources required to carry out assessment

These resources include:

- public sector legislation, regulations, policies and guidelines
- definition and benefits of workplace diversity
- public sector values and codes of conduct
- organisational procedures and protocols
- current information on diversity issues

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, including coping with difficulties, irregularities and breakdowns in routine
- working effectively with diversity in a range of (3 or more) contexts (or occasions, over time) in contexts such as participating in a workgroup or delivering client services.

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
- demonstration
- observation
- portfolios
- projects
- questioning
- scenarios
- simulation or role plays
- 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.

<i>Diversity</i> may include:	• age • cultural background • disability • educational level • ethnicity • expertise • family responsibilities • gender • interests • interpersonal approach • language • learning styles • life experience

	• marital status • not fitting the dominant paradigm of the organisation • personality • physical capability • political orientation • race • religious belief • sexual orientation • socio-economic background • thinking styles • work experience • working styles
Colleagues may include:	• peers • trainees • work experience personnel • supervisors and senior management • internal stakeholders • external stakeholders/clients/customers
Legislation, policy and guidelines may include:	• Commonwealth legislation addressing diversity issues, for example: • Racial Discrimination Act 1975 • Sex Discrimination Act 1984 • Disability Discrimination Act 1992 • Workplace Relations Act 1996 • Privacy Act 1988 • Human Rights and Equal Opportunity Commission Act 1984. • State/Territory legislation addressing diversity issues, such as Victoria's Racial and Religious Tolerance Act • public service/public sector management acts • workplace diversity guidelines • national and international codes of practice and standards • the organisation's plans, strategies and policies relating to diversity • policies relating to language services • government policy mandating equal employment opportunity and/or workplace diversity requirements, such as: • Managing diversity in the Western Australian public sector, August 1995 • Valuing cultural diversity, State of Victoria, 2002. • public sector ethics/values/codes of conduct

	• public sector management standards (subordinate law) • Commissioner's directions/instructions • community guidelines, policy and practices (such as those within Aboriginal and Torres Strait Islander communities)

Unit Sector(s)

Not applicable.

Competency field

Working in Government.

PSPMNGT604B Manage change

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 the management of planned change (rather than emergent change) that may be caused by restructuring or Machinery of Government changes, change imposed by others, or business unit initiated change. It includes confirming that change is required, determining the likely impact of change, developing a change management strategy, fostering commitment to workplace change, and implementing the change management strategy.

In practice, managing change occurs in the context of other generalist or specialist public sector workplace activities such as managing client service delivery, managing policy implementation, applying government systems, networking etc.

This unit is one of 6 units of competency in the *Working in Government* and *Management* Competency fields that deal with change. Related units are:

- PSPGOV205B Participate in workplace change
- PSPGOV306B Implement change
- PSPGOV405B Provide input to change processes
- PSPGOV514A Facilitate change
- PSPMNGT703A Lead and influence change

This unit replaces and, for qualification purposes, is equivalent to *PSPMNGT604A Manage change*. The unit no longer includes evaluation of change management strategies. Evaluation is addressed in *PSPMNGT611A Manage evaluations* in the *Management* Competency field of the Training Package.

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. Confirm that change is required	1.1 The requirement for <i>change</i> is confirmed through consideration of factors impacting upon the <i>business unit</i>, the organisation or within the political environment. 1.2 Key <i>stakeholders</i> are consulted in establishing that change is required/imminent and the nature of the change. 1.3 Benchmarking is conducted with other similar organisations/functions/best practice standards to confirm the need for change. 1.4 Specialists and experts are consulted as required to assist in the identification of major change requirements or opportunities. 1.5 The need for management support, expertise and advice is identified and addressed to maximise the advantages of change management strategies.
2. Determine the likely impact of change	2.1 The proposed change is analysed in relation to organisational structure and function, and business unit strategic objectives. 2.2 The individuals, groups and others likely to be affected by

ELEMENT**PERFORMANCE CRITERIA**

change are identified and their expectations and concerns are identified.

2.3 The eventual impact of the proposed change on employees and employee relations within the business unit is identified and explained in line with individuals' specific needs and their differing responses to change.

2.4 Options and specific proposals for change and the consequences are discussed with staff and feedback is invited to ensure that people are involved in the decisions that affect them.

2.5 Potential risks associated with change are identified and planned for in accordance with the organisation's risk management procedures.

2.6 The requirements and planned outcomes for change are communicated in accordance with government requirements.

3. Develop a change management strategy

3.1 Change management strategy and related communication strategies are prepared participatively with key stakeholders.

3.2 The **strategy** is structured to address the transition from present to future arrangements and identifies tactics for dealing with ambiguity in roles, functions, organisational priorities or structures.

3.3 Future trends and organisational needs are discussed and considered in the process of developing strategies for dealing with change.

3.4 Change management activities are designed to comply with the framework provided by relevant **legislation and organisational policy**.

3.5 Time schedules, performance standards and **interim checkpoints** are devised for change management strategies.

3.6 Approval to implement the chosen change management strategy is obtained from senior management.

4. Foster commitment to workplace change

4.1 A range of **strategies** is used to foster a positive attitude to change, especially from the individuals on whom the organisational change will have the most effect.

4.2 Advice is provided to key stakeholders on strategies for effective change management and sensitivity is shown to people's individual responses to change.

4.3 Resources required to implement change within the business unit are obtained and used.

4.4 **Leadership** and communication **strategies** are used to assist others to deal with ambiguity and adapt to change.

5. Implement a change management

5.1 Policies, practices and procedures are altered and implemented as required to support the change management strategy.

ELEMENT	PERFORMANCE CRITERIA
strategy	5.2 Barriers to change are identified and addressed in accordance with the organisation's risk management plan. 5.3 Priorities are identified, reviewed and renegotiated with key stakeholders in light of changing circumstances. 5.4 Strategies for embedding the change are activated in accordance with the change management strategy. 5.5 A system/process and performance indicators are developed to monitor the impact of change. 5.6 Adjustments to the change management strategy are implemented if necessary as a result of performance monitoring, to ensure change is managed effectively for sustained positive outcomes.

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:

- influencing and counselling in the context of change management
- engaging in negotiation and conflict resolution in a change management environment
- monitoring change management strategies
- consulting with stakeholders using a variety of words and language structures to explain complex ideas to different audiences
- interpreting and explaining complex, formal documents and assisting others to apply them in the workplace
- preparing written advice and reports requiring reasoning and precision of expression
- responding to diversity, including gender, disability
- applying public sector legislation such as occupational health and safety and environmental and sustainability requirements in the context of change management

Knowledge requirements

Look for evidence that confirms knowledge and understanding of:

- change management strategies
- effects of change
- industrial relations issues as applicable to change processes

- negotiation processes
- key factors in the internal and external operating environment
- equal employment opportunity, equity and diversity principles
- understanding of organisational goals, policies and procedures
- jurisdictional legislation applicable to management and human resource management functions

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
 - PSPGOV601B Apply government systems
 - PSPGOV602B Establish and maintain strategic networks
 - PSPLEGN601B Manage compliance with legislation in the public sector
 - 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)
- change management in a range of (2 or more) contexts (or occasions, over time)

Resources required to carry out assessment

These resources include:

- legislation, procedures and protocols
- workplace scenarios and case studies to capture the range of situations likely to be encountered when managing change

in the public sector

- change management strategies applicable to the public sector
- tactics for dealing with ambiguity

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 change, including coping with difficulties, irregularities and breakdowns in routine
- management of change in a range of (2 or more) contexts (or occasions, over time)
- a variety of contexts that reflect the continuum of change management, from dealing with concrete change requirements to managing ambiguity and uncertainty

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.

Change may occur:

- in response to government policy or Ministerial direction
- in response to Machinery of Government changes
- through organisational development or design strategies created by senior management
- through business unit level initiatives
- in response to technology changes

Business unit may refer to:

- a program
- sub-program
- cost centre
- area
- division
- branch
- production unit or section located within the organisation

Stakeholders may include:

- all those individuals and groups both inside and outside the organisation that have some direct interest in the organisation's behaviour, actions, products and services such as:
 - employees at all levels of the organisation
 - community
 - clients
 - other public sector organisations
 - union and association representatives
 - boards of management
 - government
 - Ministers
 - human resources specialists

Change management strategy may include:

- risk management plan
- communication strategy
- timeframes
- milestones
- performance indicators

Legislation and organisational policy

- Commonwealth and State/Territory legislation including equal employment opportunity and anti-discrimination law

may include:

- national and international codes of practice and standards
- environmental/sustainability practices
- the organisation's policies and practices
- government policy
- codes of conduct
- Machinery of Government changes

Interim checkpoints are :

- points throughout the change implementation where the success of change management is assessed and change management plans are altered in response

Strategies to foster commitment to change may include:

- nurturing mutually beneficial and trusting relationships with stakeholders
- team building
- process consultation
- action learning/research
- staff development and training
- guiding coalition
- using specialist expertise to support/facilitate an environment supportive of change
- organisational communication processes/mechanisms

Leadership strategies may include:

- offering guidance and direction
- mentoring
- coaching
- positive role modelling
- provision of training and support

Barriers to change may include:

- individual misunderstanding the purpose of the changes
- failure to see the need
- fear of the unknown
- fear of loss of status, security, power, friends
- lack of identification with the change
- lack of involvement in the change
- vested interests
- challenge to group norms/established roles
- conflict between personal/organisational objectives
- existing reward systems may support status quo
- interdepartmental rivalry/conflict
- threat to balance of power
- tired of change
- existing organisational culture
- change strategies poorly chosen

- history of failed change projects
- inappropriate organisational structure

Unit Sector(s)

Not applicable.

Competency field

Management.

PSPMNGT605B Manage diversity

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 productive diversity management to maximise workforce effectiveness. It includes contributing to, promoting and monitoring a diversity strategy; facilitating the development of a workforce that promotes and values diversity; and facilitating communication with a diverse workforce.

In practice, managing diversity occurs in the context of other generalist or specialist work activities such as managing compliance, managing people and performance, managing recruitment and selection, managing employee relations, managing client service etc.

This unit is one of a series of 6 competencies relating to diversity in the public sector, located in the Competency fields of *Working in Government* and *Management*. Related units of competency are:

- PSPGOV201B Work in a public sector environment
- PSPGOV308B Work effectively with diversity
- PSPGOV408A Value diversity
- PSPGOV505A Promote diversity
- PSPMNGT702A Influence and shape diversity management

This unit replaces and is equivalent to *PSPMNGT605A Manage diversity*.

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 the development of a diversity strategy	1.1 The organisational context and framework for the diversity strategy are identified and key result areas are established. 1.2 A <i>diversity strategy</i> is developed that identifies <i>diversity issues</i> and objectives to enhance business unit and organisational effectiveness in accordance with <i>public sector legislation and policies</i>. 1.3 The strategy is used to identify <i>benefits and opportunities</i> provided by a diverse workforce and complies with legislative requirements, organisational policies and practices. 1.4 Diversity objectives in the strategy are linked with the demographic profile of the client base, the organisation's strategic goals and the core business of the <i>business unit</i>. 1.5 The strategy is developed in consultation with <i>stakeholders</i>, including people from key equity groups and the organisation's clients. 1.6 The strategy is designed to provide a mechanism through which diversity issues can be integrated within <i>organisational policies and procedures</i>, for example, recruitment and selection.
2. Promote and	2.1 The strategy is communicated and <i>promoted</i> within the business

ELEMENT	PERFORMANCE CRITERIA
review diversity strategy	unit and the organisation in accordance with audience needs and organisational requirements. 2.2 The need for diversity support programs is identified and programs are established in accordance with the objectives of the diversity strategy. 2.3 Individuals are encouraged to align everyday work with the diversity strategy in recognition that individuals are the implementers who will ensure the strategy's success. 2.4 Progress of diversity strategies within business plans is monitored and reported on in accordance with organisational policy and procedures. 2.5 The effectiveness of the strategy in contributing to organisational effectiveness is monitored and reviewed according to its specifications, and recommendations for enhancements are identified and acted upon.
3. Facilitate the development of a workforce that promotes and values diversity	3.1 Benefits of a diverse workforce are identified and communicated to those working within the business unit and the organisation. 3.2 Initiatives and resources to address barriers to equal employment opportunity within the organisation are developed or adopted in accordance with the diversity strategy. 3.3 A range of leadership styles is employed to facilitate intercultural management and to manage diverse teams. 3.4 The diversity factors associated with individuals within the workforce are identified and utilised in the delivery of services to diverse clients. 3.5 A range of working styles that are reflective of a diverse workforce is accepted and encouraged, unified to the organisational context. 3.6 Diversity training and awareness programs are utilised, as appropriate, to promote the benefits of a diverse workforce.
4. Facilitate communication within a diverse workforce	4.1 Language, literacy and numeracy issues are identified and addressed to facilitate full participation of all members of the workforce in work and development activities. 4.2 A range of communication strategies is employed to meet the needs of a diverse workforce and client base. 4.3 The target audience is identified and tailored communications strategies are adopted. 4.4 Resources to facilitate effective communication within the workplace are identified and utilised in accordance with organisational policy and procedures. 4.5 Ineffective and inappropriate communication strategies are identified and adjusted to meet the information needs of a

ELEMENT

PERFORMANCE CRITERIA

diverse workforce and client base.

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:

- monitoring and reporting on the progress of diversity strategies
- using communication involving exchanges of complex oral information
- communicating with people from diverse backgrounds (including gender and disability)
- managing diverse teams
- applying intercultural management
- using a variety of words and language structures to explain complex ideas to diverse audiences
- interpreting and explaining complex, formal documents and assisting others to apply them in the workplace
- preparing written advice and reports requiring reasoning and precision of expression
- using plain English in written documents

Knowledge requirements

Look for evidence that confirms knowledge and understanding of:

- the concept of diversity and its integration within and across all human resource and management functions and areas
- cultural diversity, including issues of racism, discrimination, harassment and victimisation
- the organisation's policies and strategic goals relating to diversity and the implications of these for current and future human resource management
- the relationship between management of diversity and organisational effectiveness
- equal employment opportunity, access and equity principles
- productive diversity principles including flexibility, multiplicity, devolution, negotiation and pluralism
- institutional racism and resulting indirect discrimination
- jurisdictional legislation, instructions, directions and standards that underpin or impact on workplace diversity

- public sector policies, practices and procedures related to diversity

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
 - PSPGOV601B Apply government systems
 - PSPGOV602B Establish and maintain strategic networks
 - PSPLEGN601B Manage compliance with legislation in the public sector
 - PSPMNGT603B Facilitate people management
 - PSPMNGT606B Manage quality client service
 - PSPMNGT615A Influence workforce effectiveness
 - 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)
- diversity management in a range of (2 or more) contexts (or occasions, over time)

Resources required to carry out assessment

These resources include:

- information on diversity management in the context of public sector management and human resource management
- legislation, policy, procedures and guidelines relating to/impacting on diversity
- case studies and workplace scenarios to capture the range of

situations likely to be encountered when managing diversity

**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 in the workplace, including coping with difficulties, irregularities and breakdowns in routine
- management of diversity in a range of (2 or more) contexts (or occasions, over time)
- a variety of management contexts (2 or more) such as managing compliance, managing people and performance, managing recruitment and selection, managing employee relations, managing client service etc

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
- simulation or role plays
- 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.

A diversity strategy is:

- an expression of what a business unit or organisation intends to do to utilise diversity as a productive resource in order to maximise effectiveness and efficiency

Diversity issues may include:

- equal employment opportunity issues such as:
 - direct and indirect discrimination - discriminatory systems and practices
 - harassment
 - racism
 - under-representation of equity groups in the public sector
 - employment of equity groups concentrated at lower levels in the public sector
 - women making up more than half of the public sector workforce but disproportionately represented at lower salary levels
 - barrier (or glass ceiling) that prevents equity group members progressing to higher salary levels
 - disproportionate representation of equity group members in non-permanent, casual or contract positions
 - inappropriate supervisory treatment of equity group members
 - sidelining staff from diverse backgrounds to 'diversity roles' rather than the opportunity to pursue what interests them, or where they add most value
 - workplace systems or practices that don't allow a balance between work and family responsibilities
 - inequitable access to acting opportunities, workplace training and development
 - culturally inappropriate workplaces
 - making reasonable adjustment to work processes
 - enabling access to buildings to people with a disability
 - quality of service delivery to clients from diverse backgrounds
- people from recognised diversity groups not choosing to be identified through usual statistical collection methods

Public sector legislation and policies (relating to diversity) may include:

- questioning/disregarding the dominant paradigm of the organisation
- inappropriate treatment of those who don't fit the dominant paradigm of the organisation
- risks associated with diversity not managed
- different values:
 - uncertainty avoidance
 - collectivist/individualist
 - power/distance
 - masculine/feminine
- resolving communication issues
- developing cultural competence
- negotiating commonalities
- resolving conflict
- negotiating difference
- Commonwealth legislation addressing diversity issues, for example:
 - Racial Discrimination Act 1975
 - Sex Discrimination Act 1984
 - Disability Discrimination Act 1992
 - Workplace Relations Act 1996
 - Privacy Act 1988
 - Human Rights and Equal Opportunity Commission Act 1984
- State/Territory legislation addressing diversity issues, such as Victoria's Racial and Religious Tolerance Act
- public service/public sector management acts
- workplace diversity guidelines
- national and international codes of practice and standards
- the organisation's plans, strategies and policies relating to diversity
- policies relating to language services
- government policy mandating equal employment opportunity and/or workplace diversity requirements, such as:
 - Managing diversity in the Western Australian public sector, August 1995
 - Valuing cultural diversity, State of Victoria, 2002
- public sector ethics/values/codes of conduct
- public sector management standards (subordinate law)
- Commissioner's directions/instructions

Benefits and opportunities of diversity in the workplace may include:

- community guidelines, policy and practices (such as those within Aboriginal and Torres Strait Islander communities)
- improved client service (internal and external)
- improved access to government services and programs
- improved relationship with the community
- wider sources of recruitment
- greater responsiveness to change
- cultural enrichment
- a workplace reflective of local demographics
- promotion of creativity
- retention of staff
- community public relations
- facilitation of attainment of organisation goals
- improved service delivery
- promoting equity and fairness
- creation of a harmonious and supportive work environment
- increased skills and experience added to the workplace
- balanced workforce in terms of age, gender, race and culture

Business unit may include:

- a program
- sub-program
- cost centre
- area
- division
- branch
- production unit or section located within the organisation

Stakeholders may include:

- all those individuals and groups both inside and outside the organisation that have some direct interest in the organisation's behaviour, actions, products and services, including
- employees at all levels of the organisation
- other government and non-government organisations
- union and association representatives
- boards of management
- government
- Ministers
- community
- clients

Organisational policies and procedures may

- recruitment and selection
- learning and development

relate to:

- performance management
- promotion and retention of staff
- employment conditions
- organisational mission and values
- performance assessment

Methods of promoting diversity plans may include:

- written documentation
- manuals
- policy and procedure statements
- guides
- information brochures and pamphlets
- oral advice and guidance
- one-on-one meetings
- small group meetings
- telephone contact and/or electronic mail
- training programs
- online resources

Diverse workforce refers to:

- a workforce comprising employees with differences in:
 - age
 - culture
 - disability
 - educational background
 - ethnicity
 - expertise
 - family responsibilities
 - gender
 - interests
 - interpersonal approach
 - language
 - learning styles
 - life experience
 - marital status
 - not fitting the dominant paradigm of the organisation
 - personality
 - physical capability
 - race
 - religious belief
 - sexual orientation
 - socio-economic status
 - thinking styles

- work experience
 - working styles
- Barriers to equal employment opportunity*** may include:
- individual and structural/institutional racism, sexism and other forms of exclusion and discrimination
 - direct and indirect discrimination
 - issues related to cultural diversity
 - exclusionary workplace practices
- Communication strategies*** may include:
- small group information sessions
 - use of plain English
 - translated information
 - use of bilingual staff

Unit Sector(s)

Not applicable.

Competency field

Management.

RIIOHS204A Work safely at heights

Modification History

Not applicable.

Unit Descriptor

This unit covers working safely at heights in resources and infrastructure industries. It includes: identifying the work requirements, work procedures and instructions for the task; accessing and installing equipment; performing work at heights; and cleaning up the work area.

Application of the Unit

This unit specifies the competency required to undertake safe working practices when working at heights or depths.

This unit is appropriate for those working in a operational roles, at worksites within:

- Civil construction
- Coal mining
- Drilling
- Extractive industries
- Metalliferous mining

Licensing/Regulatory Information

Refer to Unit Descriptor.

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

ELEMENT	PERFORMANCE CRITERIA
1. Identify work requirements	1.1. Access, interpret and apply compliance documentation relevant to working safely at heights 1.2. Identify the scope of the task 1.3. Adhere to OHS requirements associated with working safely at heights, and the workplace environment throughout the work 1.4. Inspect site to determine layout and physical condition, condition of structures, prevailing weather conditions, equipment requirements and potential hazards 1.5. Identify and document scope of the task and proposed work practices/activities 1.6. Identify, select and check safety equipment for serviceability 1.7. Identify, manage and report potential risks and hazards
2. Identify work procedures and instructions for the task	2.1. Select materials, tools and equipment , including personal safety equipment, and check for serviceability 2.2. Inspect/install fall protection and perimeter protection equipment ensuring adequacy for work and conformance to regulatory requirements 2.3. Identify approved methods of moving tools and equipment to work area and minimise potential hazards associated with tools at heights 2.4. Install safety system in accordance with requirements 2.5. Select and install appropriate signs and barricades
3. Access and install equipment	3.1. Correctly fit, adjust and anchor fall protection and associated equipment

	3.2. Make appropriate arrangements to install required equipment 3.3. Use recommended methods to access work area for people, tools and equipment 3.4. Place tools and materials to eliminate or minimise the risk of items being knocked down
4. Perform work at heights	4.1. Check access from ground to work area to ensure it is safe and in accordance with requirements 4.2. Keep fall equipment in place and adjusted appropriately to allow for movement during work 4.3. Undertake manual handling of materials and equipment in accordance with requirements 4.4. Locate materials and equipment ensuring that they are safely secured and distributed 4.5. Check safety system periodically for compliance with requirements and procedures 4.6. Monitor risk control measures to ensure that they are effective and appropriate to the task and work environment 4.7. Reassess risk control measures, as required, in accordance with changed work practices and/or site conditions and undertake alterations
5. Clean up work area	5.1. Dismantle safety system in accordance with sequence and remove from worksite 5.2. Clear work area and dispose of or recycle materials 5.3. Clean, check, maintain and store tools and equipment

Required Skills and Knowledge

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

Required skills

Specific skills are required to achieve the performance criteria in this unit, particularly

for the application in the various circumstances in which this unit may be applied. This includes the ability to carry out the following as required to work safely at heights:

- apply legislative, organisation and site requirements and procedures
- access, interpret and apply technical and safety information
- apply diagnostic/faultfinding techniques
- apply environmental requirements
- apply isolation procedures
- work in varying weather conditions

Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly its application in a variety of circumstances in which the unit may be used. This includes knowledge of the following, as required to work safely at heights:

- the names and functions of equipment, components and materials
- equipment manufacturer's instructions and specifications
- safe shifting and handling of tools and materials
- statutory and regulatory authority requirements
- the nature of work undertaken at heights
- heights safety systems
- the processes of providing for safe working practices
- safety equipment/systems and considerations to facilitate working safely at heights
- safe work methods

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	The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following: • knowledge of the requirements, procedures and instructions for working safely at heights • implementation of requirements, procedures and techniques for safe, effective and efficient working at heights

	• working with others to undertake and complete work safely at heights that meets all of the required outcomes • consistent timely completion of work at heights that safely, effectively and efficiently meets the required outcomes
Context of and specific resources for assessment	• This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills. • The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job. • Customisation of assessment and delivery environment to sensitively accommodate cultural diversity. • Aboriginal people and other people from a non English speaking background may have second language issues. • Assessment of this competency requires typical resources normally used in the work environment. Selection and use of resources for particular worksites may differ due to site circumstances. • Where applicable, physical resources should include equipment modified for people with disabilities. • Access must be provided to appropriate learning and/or assessment support when required.
Method of assessment	This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods: • written and/or oral assessment of the

	candidate's required knowledge - observed, documented and/or first hand testimonial evidence of the candidate's: - implementation of appropriate requirement, procedures and techniques for the safe, effective and efficient achievement of required outcomes - consistently achieving the required outcomes - first hand testimonial evidence of the candidate's: - working with others to undertake and complete work safely at heights
Guidance information for assessment	Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.

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 compliance documentation may include:	- legislative, organisation and site requirements and procedures - manufacturer's guidelines and specifications - Australian standards - code of practice - Employment and workplace relations legislation - Equal Employment Opportunity and Disability Discrimination legislation
OHS requirements may include those associated with:	- protective clothing and equipment - use of tools and equipment - workplace environment and safety - handling of materials - use of fire fighting equipment - use of First Aid equipment - hazard control

	• hazardous materials and substances
Hazards may include:	• falling objects • removal of scaffold components • inappropriate carrying of materials on ladders • excessive bending or twisting in different work situations
Tools and equipment may include:	• fall protection • perimeter protection • signage and barricades • ladders • lifting/load shifting equipment including: • hand trolleys • rollers • forklifts • chain blocks • hoists • jacks • scaffolds • elevated work platforms • lifting equipment (such as cranes)
Safety systems may include:	• scaffolds • handrails • foot walks • kickboards • safety harness • harness fixing points

Unit Sector(s)

Occupational Health and Safety

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.

FDFPH2001A Apply Good Manufacturing Practice procedures

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge required to comply with relevant Good Manufacturing Practice (GMP) codes through the implementation of workplace GMP and quality procedures.

Application of the Unit

Application of the unit	This unit applies to all production and packaging operators working in the pharmaceutical sector.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify requirements of GMP related to own work	1.1. Sources of information on GMP requirements are located 1.2. GMP requirements and responsibilities related to own work are identified
2. Ensure that personal hygiene and conduct meets GMP requirements	2.1. Personal hygiene meets GMP requirements 2.2. Clothing is prepared, used, stored and disposed of according to GMP and workplace procedures 2.3. Personal movement around the workplace complies with area entry and exit procedures
3. Implement GMP requirements when carrying out work activities	3.1. Work area, materials, equipment and product are routinely monitored to ensure compliance with GMP requirements 3.2. Raw materials, packaging components and product are handled/stored according to GMP and workplace procedures 3.3. Workplace procedures to control resource allocation are followed to meet GMP requirements 3.4. Common forms of contamination are identified and appropriate control measures are followed according to GMP requirements 3.5. The workplace is maintained in a clean and tidy order to meet GMP housekeeping standards 3.6. Work is conducted in accordance with workplace environmental guidelines 3.7. Out-of-specification or contaminated materials, packaging components/consumables and product, waste and recyclable materials are handled and disposed of according to GMP requirements and workplace procedures

ELEMENT	PERFORMANCE CRITERIA
	3.8. Signs of unacceptable plant or equipment condition are identified and reported
4. Participate in improving GMP	4.1. Processes, practices or conditions which could result in non-compliance with GMP are identified and reported according to workplace reporting requirements 4.2. Corrective action is implemented within level of responsibility 4.3. GMP issues are raised with designated personnel
5. Complete workplace documentation to support GMP	5.1. Documentation and recording requirements are identified 5.2. Information is recorded according to workplace reporting procedures to meet GMP requirements

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Ability to:

- locate and follow workplace information relating to GMP responsibilities
- identify and report situations that do or could compromise GMP
- participate in procedures to support GMP within level of responsibility
- identify and respond to out-of-specification or unacceptable raw materials, packaging components, final or part processed product within level of responsibility
- use oral communication skills/language competence to fulfil the job role as specified by the organisation, including questioning, active listening, asking for clarification and seeking advice from supervisor
- work cooperatively within a culturally diverse workforce

Required knowledge

Knowledge of:

- the role of GMP in preventing contamination, its relationship to legal requirements of pharmaceutical manufacturers and potential implications of non-compliance
- GMP arrangements in the workplace, including relevant GMP codes of practice and related workplace policies and procedures to implement these responsibilities

REQUIRED SKILLS AND KNOWLEDGE

- the relationship between GMP and the quality system, personnel responsible for designing and managing GMP, personal role to maintain GMP, and the role of internal and external auditors as appropriate
- procedures followed to investigate contamination events and performance improvement processes
- personal clothing and footwear requirements for working in and/or moving between work areas
- personal clothing use, storage and disposal requirements
- awareness of common micro-biological, physical and chemical contaminants relevant to the work process, including the types of contamination likely to occur, such as cross-contamination, the conditions under which they occur, possible consequences and control methods to prevent occurrence
- basic concepts of quality assurance, including quality specifications, operating parameters, validation procedures and control methods, and related documentation, including standard operating procedures (SOPs) and/or batch instructions
- control methods and procedures used in the work area to maintain GMP, including an understanding of the purpose of control, the consequence if not controlled and the method of control where relevant, as well as an understanding of the methods used to monitor process control
- basic understanding of the properties, handling and storage requirements of raw materials, packaging components and final product handled and used
- standards for materials, equipment and utensils used in the work area
- procedures for responding to out-of-specification or unacceptable performance/outcomes
- purpose of keeping records and the recording requirements of GMP, including product and materials traceability procedures
- housekeeping requirements and responsibilities relating to own work, and use and storage of housekeeping/cleaning equipment where relevant
- waste collection, recycling and handling procedures relevant to own work responsibilities
- responsibilities for reporting and recording quality 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 may occur in a real or simulated pharmaceutical or complementary medicine

EVIDENCE GUIDE	
	manufacturing workplace where the assessment environment provides access to workplace documentation related to GMP together with a range of commercial production/packaging equipment and activities typical of commercial manufacturing businesses and that meet the requirements of the Therapeutic Goods Act.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	GMP is an ongoing and routine aspect of work responsibilities. Assessors should collect sufficient evidence to ensure that the skills and knowledge of this unit are routinely applied to the work environment. Assessment must require the candidate to identify and demonstrate responsibilities for implementation of GMP in the workplace.
Context of and specific resources for assessment	Assessors must be satisfied that the person can consistently perform the unit as a whole, including all elements, performance criteria, and required skills and knowledge. A holistic approach should be taken to the assessment. Assessment of this unit would typically involve questioning and workplace observation. It may involve additional collection of evidence from a range of sources, such as third party reports, workplace documentation relating to GMP and real or simulated workplace contexts.
Method of assessment	This unit is a core requirement for all pharmaceutical operators at AQF 2 and could be assessed concurrently with other operational units.
Guidance information for assessment	To ensure consistency in one's performance, competency should be demonstrated on more than one occasion over a period of time in order to cover a variety of circumstances, cases and responsibilities, and where possible, over a number of assessment activities.

Range Statement

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.	
Policies and procedures	Work activities are carried out according to company policies and procedures, regulatory and licensing requirements, legislative requirements and industrial awards and agreements
Unacceptable plant or equipment condition	Unacceptable plant or equipment condition can include: • damage to plant or equipment • failure of cleaning regime • signs of pest infestation
Legislative requirements	Legislative requirements are typically reflected in procedures and specifications. Legislation relevant to this industry includes: • relevant GMP codes • the Therapeutic Goods Act • other legislation and codes relevant to product and market • legislation relating to environmental management, occupational health and safety (OHS), anti-discrimination and equal opportunity

Unit Sector(s)

Unit sector	Pharmaceutical manufacturing

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MEM04001B Operate melting furnaces

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers operating a metal melting furnace.

Application of the Unit

Application of the unit	This unit applies to the operation of singular or multi, coke, oil, gas fired or electric furnaces, the melting of a range of metals, and operational maintenance. Furnaces would primarily be used for continuous or staged bulk melting/smelting of metals, holding of hot liquids, or the melting of metals for production processes e.g. casting/moulding, galvanising, etc. Band: A Unit Weight: 4

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM13004B	Work safely with molten metals/glass

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Select materials	1.1.Requisitions are completed as required according to standard operating procedures. 1.2.Charge analysis is undertaken in accordance with standard operating procedures. 1.3.The charge analysis is converted to furnace charge weight using standard operating procedures. 1.4.Charge is weighed according to standard operating procedures.
2. Start up furnace	2.1.Furnace is inspected for any defects or damage. 2.2.Routine operational maintenance of furnace is undertaken to standard operating procedures. 2.3.Furnace is started up to standard operating procedures. 2.4.Faults are reported according to standard operating procedures.
3. Charge furnace	3.1.Emergency/safety procedures are identified and followed as necessary. 3.2.Materials are pre-heated if required according to standard operating procedures. 3.3.Materials are charged into furnace using standard

ELEMENT	PERFORMANCE CRITERIA
	operating procedures. 3.4. Suitable areas for emergency unloading of molten metal are identified and kept available.
4. Monitor furnace	4.1. Furnace is maintained at optimum operating condition to standard operating procedures. 4.2. Sample for chemical analysis is taken and remedial action is applied as required to standard operating procedures. 4.3. Furnace is drossed and/or degassed to standard operating procedures. 4.4. Temperature of metal is checked and adjustment made if necessary.
5. Tap or unload the furnace	5.1. Quantity of the required metal is identified. 5.2. Tap rate is carried out to standard operating procedures. 5.3. Tapping or unloading is undertaken and completed safely according to standard operating procedures.
6. Shut down furnace	6.1. Shut-down of furnace is completed to standard operating procedures. 6.2. Routine operational maintenance of furnace is undertaken 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 and interpreting routine information on written job instructions, specifications, standard operating procedures relevant test data sheets and other standard workplace forms. May include drawings for furnace operation
- following oral instruction
- entering routine and familiar information onto proformas and standard workplace forms
- identifying faults and areas for routine repair of the furnace and performing routine maintenance as necessary

REQUIRED SKILLS AND KNOWLEDGE

- following procedures for starting and closing down the furnace
- deciding on charge materials
- weighing charge materials
- feeding materials into furnace
- measuring metal temperature and correcting as necessary
- sampling for chemical, carbon equivalent and wedge tests
- degassing as necessary
- deslagging/drossing
- tapping the metal

Required knowledge

Look for evidence that confirms knowledge of:

- refractory conditions, faults, and routine repair
- condition of cooling water supply
- starting procedures for different types of furnaces
- metallic charge materials and alloying elements
- weighing procedures and scale types
- correct order of loading of different charge materials
- thermocouple condition monitoring and adjustment mechanism for furnace
- interpretation of carbon equivalent and wedge test results
- degassing procedures including tablet, lance and other procedures
- coagulant agents, application procedures and slag removal procedures
- close-down procedures
- 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
- hazards and control measures associated with operating melting furnaces

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 operate a melting furnace. 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 operating melting furnaces 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.

Furnace	Singular or multi, coke, oil, gas fired or electric induction, arc and resistance furnaces
Operational maintenance	Routine lubrication, cleaning, routine repair/repointing of refractory

Unit Sector(s)

Unit sector	

Co-requisite units

Co-requisite units	

Competency field

Competency field	Casting and moulding

MSS402002A Sustain process improvements

Modification History

New unit, superseding MSACMS201A Sustain process improvements - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to prevent process improvements in their own work from slipping back to former practices or digressing to less efficient practices.

Application of the Unit

This unit applies to organisations implementing competitive systems and practices and continuous improvement. It covers the skills needed to ensure that process improvements are sustained and opportunities taken to suggest further improvements.

Improvement initiatives can be made by any of a number of methods and by teams or individuals. The unit assumes that desired levels of performance or quality are known to employees.

The unit can be applied to all areas of an organisation, including production, maintenance, logistics and office functions.

This unit requires the application of skills associated with problem solving, initiative and enterprise and self-management in order to understand implement and monitor improvement practices. It also requires the ability to identify and address personal skill gaps in order to manage own ability to implement change.

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 performance needed to

essential outcomes of a unit of competency. 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	Examine previous improvements	1.1	Identify impact of previous process improvements to equipment, operations, services or products in own work area
		1.2	Identify improvements where objectives have not been met
2	Implement corrective actions	2.1	Identify corrective actions that can be taken by self on process improvements that have not met objectives
		2.2	Obtain any required approvals
		2.3	Identify any additional, personal skill gaps and seek skill development
		2.4	Adopt improved processes
3	Check changes	3.1	Identify claimed improvements
		3.2	Identify methods of observing and measuring claimed improvements in own work area
		3.3	Check if claimed improvements are occurring and report problems in accordance with procedures
4	Check for further improvements	4.1	Look for areas of possible further improvement
		4.2	Discuss further improvements with peers and supervisors
		4.3	Take action to implement improvements in accordance with procedures

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with others to clarify scope and stage of implementation of competitive systems and practices and contribute suggestions for further improvements in implementation
- visualising normal operational procedures in terms of flow and contribution to customer outcomes
- planning own tasks to support competitive systems and practices implementation
- implementing competitive systems and practices in own work area according to instructions
- identifying waste (muda)
- monitoring competitive systems and practices performance indicators in own work and work area

Required knowledge

Required knowledge includes:

- internal and external customers and the value they derive from own work area operations
- suppliers to own work area, their capabilities and contribution to customer benefit
- waste (muda)
- relevant competitive systems and practices for own job and how to apply and monitor the outcomes
- factors impacting on product, operations and waste, particularly those wholly or partially under their control (and how to control them)

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 being assessed against this unit will be able to demonstrate their willing adoption of new equipment, processes, procedures and practices as well as their

	expertise at implementing them and making critical reviews of their performance in line with their level of competence and authority.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • implement and monitor process improvements in own work area against objectives • contribute suggestions for further improvement/s • apply procedures for seeking approvals and reporting non-conformances.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made

	to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts

	• standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and industry sector
Customers	Customers may be: • internal or external customers and should be sufficiently close to the individual's work as to be easily identifiable • final customers used as the basis for the identification of value and waste The individual does not need to interface directly with the external customer, but should be provided with sufficient information to enable them to identify customer benefits and customer features
Suppliers	Suppliers may be: • internal or external suppliers and should be sufficiently close to the individual's work as to be easily identifiable The operator does not need to interface directly with external suppliers, but should be provided with sufficient information to enable them to identify supplier contribution to their own work and to customer benefit
Measuring improvements	Measuring improvements may include: • personally taking measurements • arranging for measurements to be taken/made by appropriate personnel
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/recipe • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing

	practice (GMP) and responsible care) and government regulations Procedures may be: written, verbal, computer-based or in some other format
Improvements	Improvements include: - techniques for preventing mistakes by designing the operations process, equipment and tools so that an operation literally cannot be performed incorrectly (e.g. baka-yoke) - techniques that generate warning signals were a mistake is about to be performed (poka-yoke)

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402030A Apply cost factors to work practices

Modification History

New unit, superseding MSACMT230A Apply cost factors to work practices - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by an individual to identify cost components in their work and to be able to determine, in general terms, the cost impacts of alternative actions.

Application of the Unit

This unit applies to an individual who is required to contribute to, and be involved in, the assessment of cost factors in their work. This may be done individually or in a team environment.

The unit covers the skills to be able to assess the relative costs of the alternatives and use this as one of the key factors in making decisions. Decisions are made within the scope of the employee's authority and according to procedures. Typical decisions include those that contribute to the efficient organisation of own work and the improvement of production time and cycle times.

This unit requires the application of skills associated with problem solving to identify cost factors and cost implications of own work and self-management to apply cost-effective practices.

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

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

unit of competency. 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 the major cost components of product or process in own work area	1.1	Identify cost components in the product or process in own work area
		1.2	Recognise the impact of current or alternative actions on costs
2	Identify constraints to cost-efficiency	2.1	Identify required production/process rate and major costs
		2.2	Identify costs factors under individual or team control
		2.3	Relate identified costs factors to impact on overall cost of production/process
		2.4	Identify cost factors that are a constraint to cost-efficiency in own work area
3	Apply cost-efficient work practices	3.1	Identify and explain to relevant people the implications of possible actions/changes to improve cost-efficiency in simple financial terms
		3.2	Identify non-financial implications of proposed changes in discussion with relevant people
		3.3	Select actions which minimise overall costs
		3.4	Monitor actions to ensure cost-efficiency in own work area is maintained

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with others to clarify cost factors and contribute suggestions for improvement
- visualising normal operational procedures in terms of flow
- distinguishing between fixed and variable costs
- identifying fixed and variable cost components relevant to own work, including where applicable:
 - power/energy
 - materials, plant and equipment
 - production or process time, including impact on salary and wages
 - office expenses
 - government taxes and charges

Required knowledge

Required knowledge includes:

- cost components of products made
- costs concepts, such as expense and income
- major cost contributors to product (e.g. energy)
- the difference between internally and externally controlled costs
- difference between overhead, labour and consumables

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify the scope of their own and their teams work and relate it to the overall flow of work in the organisation • express cost factors in specific terms (e.g. cost per

	item, process and task) and not just in a general manner • identify and express costs factors in simple financial terms • use cost factors to select lower cost alternatives when making decisions.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems

	and practices - the size of the enterprise - the work organisation, culture, regulatory environment and the industry sector
Cost components	Cost components include: - fixed and variable costs, such as power/energy, materials, plant and equipment, production or process time, including impact on salary and wages - office expenses, such as telephone - government taxes and charges
Process	Process may include: a production, maintenance, logistics, office or other support process in an organisation
Overall cost	Overall cost may include: - the assessment of negative and positive financial implications - negative long-term issues, such as occupational health and safety (OHS), environmental and regulatory issues

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402031A Interpret product costs in terms of customer requirements

Modification History

New unit, superseding MSACMT231A Interpret product costs in terms of customer requirements - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by an individual to be able to identify the major cost components of either products or processes, the basic relationship of these to customer benefit, and use this to help minimise waste (defined as anything not delivering value as defined by the customer). It has a different focus to MSS402030A Apply cost factors to work practices, which focuses on costs in isolation, whereas this unit regards all costs not directly leading to customer benefit as waste.

Application of the Unit

This unit applies to an individual who uses their understanding of the customer's requirements of the product or process being undertaken as the basis for investigating work processes to identify waste sources and then takes action relevant to their level of competency and authority to reduce this waste. It requires an understanding of both the cost factors in the products they make and also the benefits which the customer derives from the product.

This competency may be performed individually or in a team-based environment.

This unit requires the application of skills associated with analysis and problem solving to identify waste and determine ways to minimise waste. This unit requires initiative and enterprise and application of learning in concepts of waste and waste minimisation.

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 cost components deriving from customer benefit and other costs	1.1	Identify customer features/benefits in product or process being undertaken
		1.2	Identify cost components which deliver customer features/benefits and those which do not
2	Compare required performance of product or process steps with actual performance	2.1	Identify performance required to meet customer needs in own work and that of team
		2.2	Identify actual performance
		2.3	Compare cost components of products or process with current customer-related targets
		2.4	Separate costs components into those that contribute to customer features/benefits and those that do not
		2.5	Determine non-contributing cost components which are under control of the individual or team
3	Minimise waste	3.1	Recommend changes to eliminate or reduce waste
		3.2	Adopt changes which minimises waste
		3.3	Monitor effect of changes to ensure gains are made against customer features/benefits

Required Skills and Knowledge

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

Required skills

Required skills include:

- identifying customer benefit in own work and that of the individual's team
- identifying financial and other performance indicators for own work and of team, including where appropriate, takt time
- communicating with others to clarify cost factors and contribute suggestions for improvement
- visualising normal operational procedures in terms of flow
- distinguishing between fixed and variable costs
- classifying fixed and variable cost components in terms of relevancy to customer benefit, including where applicable:
 - power/energy
 - materials, plant and equipment
 - production or process time, including impact on salary and wages
 - required and unnecessary downtime
 - office expenses
 - government taxes and charges

Required knowledge

Required knowledge includes:

- value as defined by the customer and the relevancy to own and team's work
- ability to access company information about:
 - customer features/benefits
 - cost components of products made
 - costs concepts, such as expense and income
 - major cost contributors to product (e.g. energy)
- the difference between internally and externally controlled costs
- difference between overhead, labour and consumables

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify customer benefit from own and team's work • express cost factors (financial and other factors) in specific terms (e.g. cost per item, process and task), and not just in a general manner • identify and express costs factors in simple financial terms • contribute suggestions for improvement to minimise waste and overall costs.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.

	Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just In Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving

	• run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Customer features/benefits	Customer features/benefits include: • characteristics of the product or service which add value to the customer, this value may be assessed in financial or features terms The customer may be: • internal or external
Performance	Performance may include: • the rate of output of the plant compared to the rate required to meet demand • takt, where takt time is the allowable time to produce one product at the rate and quality customers are demanding it (this is NOT the same as cycle time, which is the normal time to complete an operation on a product – which should be less than or equal to takt time)
Customer-related targets	Customer-related targets include: • internally set financial and operational targets that contribute to meeting customer features/benefits
Contributing and non-contributing cost components	Contributing costs include: • costs that make a direct contribution to customer features/benefits. These costs continue to need to be incurred (although they may be minimised) in order to gain the customer feature/benefit Non-contributing costs include: • other costs that do not contribute to customer features/benefits. These may be costs that must be maintained, such as regulatory compliance and occupational health and safety (OHS) costs and other costs which are not required and do not contribute to customer features and so should be eliminated if possible (this is also defined in terms of waste – see

	below)
Waste	Waste (also known as muda in the Toyota Production System and its derivatives) includes: • any activity which does not contribute to customer or organisation benefit/features in the product Categories of waste include: • excess production and early production • delays • movement and transport • poor process design • inventory • inefficient performance of a process • making defective items Waste for this unit may include activities which do not yield any benefit to the organisation or any benefit to the organisations customers

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402040A Apply 5S procedures

Modification History

New unit, superseding MSACMT240A Apply 5S procedures in a manufacturing environment
- Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by an employee to apply 5S procedures to their own job and work area. The unit assumes the employee has a particular job and an allocated work area and that processes in the work area are known by the individual.

Application of the Unit

This unit applies to an individual in an organisation who works in an operational position as part of production, maintenance, logistics, and so on. The unit can also apply to individuals in other organisations who have a discrete role and responsibility for individually managed processes. For employees in an office, the specific office-related unit *MSS402041A Apply 5S in an office* should be selected.

This unit applies where an organisation has decided to embark on a competitive systems and practices strategy and as part of this has adopted the philosophy of 5S as one of the tools to improve performance. The employee needs to apply 5S to their job and work area and maintain the housekeeping and other standards set by 5S.

This unit requires the application of skills associated with planning and organising, problem solving and self-management, in order to identify and implement 5S housekeeping practices.

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	Sort needed items from unneeded	1.1	Identify all items in the work area
		1.2	Sort items to achieve deliverables and value expected by downstream and final customers
		1.3	Sort items required for regulatory or other required purposes
		1.4	Place any non-essential item in a appropriate place other than the workplace
		1.5	Regularly check that only essential items are in the work area
2	Set the workplace in order	2.1	Identify the best location for each essential item
		2.2	Place each essential item in its assigned location
		2.3	After use immediately return each essential item to its assigned location
		2.4	Regularly check that each essential item is in its assigned location
3	Shine the work area	3.1	Keep the work area clean and tidy at all times
		3.2	Conduct regular housekeeping activities during shift
		3.3	Ensure the work area is neat, clean and tidy at both beginning and end of shift

4	Standardise activities	4.1	Follow procedures
		4.2	Follow checklists for activities, where available
		4.3	Keep the work area to specified standard
5	Sustain the 5S system	5.1	Clean up after completion of job and before commencing next job or end of shift
		5.2	Identify situations where compliance to standards is unlikely and take actions specified in procedures
		5.3	Inspect work area regularly for compliance to specified standard
		5.4	Recommend improvements to lift the level of compliance in the workplace

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with others to clarify issues during 5S implementation, communicate results and contribute suggestions for improvement
- visualising operations in terms of flow and contribution to customer outcomes
- planning own tasks in implementation of 5S
- implementing 5S in own work area according to instructions
- identifying waste (muda)
- prioritising activities and items
- reading and interpreting documents describing procedures
- recording activities and results against templates and other prescribed formats
- working with others
- solving problems

Required knowledge

Required knowledge includes:

- operations and processes relevant to own job
- meaning and application of 5S steps to own job and work area
- principles of efficient workplace organisation
- purposes of 5S
- methods of making/recommending improvements

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify own tasks and responsibilities and relate them to organisation and customer requirements • identify and explain the stages of 5S • implement 5S in own work area • identify waste (muda) in the work area.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects

	• suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems

	• supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
5S	5S is a system of work organisation originally developed in Japan based around housekeeping principles. A close translation of the five stages in the housekeeping approach is: • sort • set in order • shine • standardise • sustain
Sort	Sort involves keeping only what is absolutely necessary for the processes in the work area. Sort includes: • clearing the work area of all non-essential equipment and materials Non-essential items are those not required to either produce product, conduct process or operations, or make required adjustments to equipment during process or operations
Set in order	Set in order includes: • assigning required equipment and materials appropriate locations in the work area

Shine	Shine includes: • keeping the work area clean at all times. This should be carried out to a regular daily schedule against allowed time and, on most occasions, at the end of a job
Standardise	Standardising includes: • activities that help maintain the order and the housekeeping standards • using procedures and checklists developed from a procedure
Sustain	Sustain includes: • making sure that daily activities are completed every day regardless of circumstance • cleaning up after a job • undertaking inspections, including: • informal inspections carried out often, at least weekly • formal inspections carried out at least monthly • generating continuous improvement actions from daily activities • following up specific actions to generate continuous improvement
Items in work area	Items in work area may include: • tools • jigs/fixtures • materials/components • plant and equipment • manuals • personal items (e.g. bags, lunch boxes and posters) • safety equipment and personal protective equipment • other items which happen to be in the work area
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the operation of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing

	practice (GMP) and responsible care) and government regulations Procedures may be: • written, verbal, computer based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402050A Monitor process capability

Modification History

New unit, MSACMT250A Monitor process capability - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required for gathering of data and the interpretation of simple information to determine the compliance of the process and the taking of action as defined by the procedures where the information reveals the process is out of control parameters.

Application of the Unit

This unit applies to an individual in an organisation adopting specific competitive systems and practices, usually either six sigma or statistical process control/three sigma, as a means of determining and improving the capability of their process to customer requirements. The individual is involved in collecting specified data and performing specified manipulations to the data (typically by plotting on a chart or by entering into a nominated computer program). The information is typically presented to team members in terms of graphs/charts which they are expected to interpret at a basic level and then take action in accordance with procedures to restore the process to being under control parameters.

This unit requires the application of skills associated with entering and monitoring operational data and information and requires initiative, enterprise and problem solving in identifying production variations and making improvement recommendations.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

1	Collect and process data	1.1	Take specified measurements/readings, as required
		1.2	Enter data in log, computer or other record
		1.3	Manipulate and/or chart data as required by procedures
2	Identify variations that are not random and take action	2.1	Examine chart and/or reliability information
		2.2	Distinguish between random variations and those with an identifiable cause
		2.3	Take action specified in procedures when a variation with an identifiable cause occurs
3	Assist in process improvement	3.1	Collect data for process capability improvement trials
		3.2	Make recommendations for improvement
		3.3	Implement revised capability monitoring procedures

Elements and Performance Criteria

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.

Required Skills and Knowledge

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

Required skills

Required skills include:

- reading and interpreting electronic and hard copy operating instructions and documents, including where used:
 - work instructions

- standard operating procedures
- formulas/recipes
- production and batch sheets
- temporary instructions
- other provided operating instructions
- monitoring performance data against specifications and control parameters
- examining equipment procedures, products and processes for possible causes of variations
- identifying when corrective action is required by reference to procedures

Required knowledge

Required knowledge includes:

- data collection methods for operations in work area
- data processing techniques required
- basic variability and normal distribution
- recognition of identifiable causes in accordance with procedures
- causes of different types of identifiable causes as defined by procedures
- actions to be taken for the different causes

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	
	Evidence should be available of data collected and processed. There may also be evidence of assignable causes recognised and action taken. There should not be evidence of assignable causes being ignored. A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify the scope of operations, including required performance parameters in their work area • collect, enter and process data, including normal performance and variations • read and interpret data, including identifying variation to set parameters • determine where assignable causes can be allocated to variations and take appropriate action • participate in data collection, when required, for

	process capability trials • contribute suggestions for improvement.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems. • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector

Six sigma	Six sigma is a process improvement methodology based on statistical process control with six sigma limits which equates to 3.4 defects per million opportunities for each product or service transaction Six sigma is also often used as a general term covering a competitive systems and practices approach. Six sigma training typically covers several units of competency in this Training Package
Three sigma	Three sigma includes: • statistical process control with three sigma limits which equates to 3 defects per thousand opportunities for each product or service transaction
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations Procedures may be: • written, verbal, computer-based or in some other form
Random variation	Random variation is the term used in statistical control to refer to those variations for which no cause can be found
Identifiable cause	Identifiable cause (also referred to as assignable cause or special cause) refers to: • those variations for which a cause can be found and so the cause of the variation eliminated
Process capability	Process capability means the capability of the process to deliver to customer defined requirements. Process capability includes process stability against standardised practices and documentation to eliminate variation against customer requirements

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402051A Apply quality standards

Modification History

New unit, superseding MSACMT251A Apply quality standards - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to apply quality standards to work operations in an organisation. The unit is designed to complement competitive systems and practices units.

Application of the Unit

This unit applies to an individual who is expected to take responsibility for the quality of their own work, and to take actions specified in the procedures and within the scope of their job and authority to ensure that quality standards are met.

This unit requires the application of skills associated with interpreting and applying workplace standards and identifying and addressing problems that interfere with quality outcomes. The unit requires initiative, enterprise and self-management to ensure quality standards are achieved.

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	Assess own work	1.1	Continuously check completed work against workplace standards relevant to the operation being undertaken
		1.2	Demonstrate an understanding of how the work activities and completed work relate to the next production process or processes and to the final products or services concerned
		1.3	Identify and isolate faulty components, products or processes
		1.4	Record and/or report faults and any identified causes to the supervisor concerned, where required, in accordance with workplace procedures
2	Assess quality of received components, parts or materials	2.1	Continuously check received components, parts, materials, information, service or final products against workplace standards and specifications for conformance
		2.2	Demonstrate an understanding of how the received components, parts or materials, information or service relate to the current operation and how they contribute to the final quality of the product or service
		2.3	Identify and isolate faulty components, parts, materials or information that relate to the operator's work
		2.4	Record and/or report faults and any identified causes in accordance with workplace procedures
		2.5	Identify causes of any identified faults and take corrective action as specified in workplace procedures
3	Measure components, parts or materials	3.1	Measure materials, component parts, information, service or products, as required, using the appropriate measuring instruments in accordance with workplace procedures

4	Record information on production indicator	4.1	Record basic information on quality and other indicators of process performance in accordance with workplace procedures
5	Investigate causes of quality deviations	5.1	Investigate and report causes of deviations from specified quality standards for components
		5.2	Recommend suitable preventative action based on workplace quality standards and the identified causes of deviations from specified quality standards of materials

Required Skills and Knowledge

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

Required skills

Required skills include:

- interpreting work instructions, specifications, standards and patterns appropriate to own work
- carrying out relevant visual inspections of materials, component parts and final products
- carrying out relevant physical/chemical measurements or tests
- maintaining accurate work records in accordance with procedures
- carrying out work in accordance with occupational health and safety (OHS) policies and procedures
- meeting work specifications
- communicating effectively within defined workplace procedures
- interpreting and applying defined procedures

Required knowledge

Required knowledge includes:

- relevant quality standards, policies and procedures
- relevant production processes, materials and products
- basic characteristics of materials used in the relevant production processes
- safety and environmental aspects of relevant production processes
- relevant measurement techniques and quality checking procedures
- workplace procedures
- reporting procedures

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • interpret, relevant work instructions, standards and specifications appropriate to own work • check and measure relevant quality parameters • interpret results of quality checks in terms of specifications, patterns and work standards • take required action where standards of materials, component parts, final product or work processes are found to be unacceptable • maintain accurate records.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of

	contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis

	• 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Quality parameters	Quality parameters may include: • finish • size • durability • product or process variations • materials • alignment • colour • damage and imperfections • time
Quality checks	Quality checks are against set parameters for the process or product. Examples include: • visual inspection • physical measurements • chemical tests • checks against patterns, templates and guides • processing time
Materials	Materials may include: • physical raw materials • orders, forms and other documentation • services required for undertaking an operation (e.g. power, water, compressed air and fuel)

Measure	Measure includes: those measurements which may be taken by the employee in the workplace/at their work station
Procedures	Procedures may include: - work instructions - standard operating procedures - formulas/recipes - batch sheets - temporary instructions and similar instructions provided for the operation of the plant - good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) - government regulations Procedures may be: - written, verbal, computer-based or in some other format
Indicators of production performance	Indicators of production performance may include: - number of items/production rate - delays and causes of delays (where known) - other information as specified in the procedures
Data entry/recording	Data entry/recording may include: - keyboard - written (including ticks or signs) - verbal
Sources of information/ documents	Sources of information/documents may include: - quality and Australian standards and procedures - work instructions, patterns, designs and recipes - organisation work procedures - manufacturer instructions for materials and equipment - organisational or external personnel - customer requirements
Investigate and report	Investigate and report includes: - following set procedures defined for such investigations Set procedures may include: - verbal instructions

	- documented procedures - other quality procedures as implemented within an organisation or work environment
Workplace context	Workplace context includes: - work organisation procedures and practices relating to the manufacture and quality outcomes for products - conditions of service, legislation and industrial agreements, including: - workplace agreements and awards - federal or state/territory legislation - standard work practice
Reporting/communication	Reporting/communication may include: - verbal and written communication in accordance with organisational policies and procedures - oral, written or visual communication and may include simple data
Being responsible for the maintenance of own work quality	Being responsible for the maintenance of own work quality may include: - contributing to the quality improvement of team or section output, where necessary, in accordance with workplace procedures - following safety, environmental, housekeeping and quality procedures as specified by materials/machine/equipment manufacturers, regulatory authorities and the organisation
Applicable regulations and legislation	Applicable regulations and legislation may include: - OHS legislation relevant to workplace activities - workers compensation legislation

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402060A Use planning software systems in operations

Modification History

New unit, superseding MSACMT260A Use planning software systems in manufacturing -
Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to access planning software (often known as Enterprise resource Planning (ERP), Materials Resource Planning (MRP and MRPII), and often by a proprietary name, to make routine business decisions required of the person as a regular part of their job.

Application of the Unit

This unit applies to an individual in an organisation using a planning software system and who must interface with that system. The unit applies to both accessing information from the planning software system and using it as an aid to decision making. This unit requires the application of communication, planning, and problem solving associated with using planning software in own work.

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	Use interface	1.1	Identify terminals relevant to own work station and functions
		1.2	Use keyboards, track ball/mouse and monitor and/or other peripherals to access system
		1.3	Navigate through system and screens to find program menu and data relevant to own work
		1.4	Identify and input information on own work processes at required frequency and to required detail
		1.5	Access message section and acknowledge messages
		1.6	Identify problems and make suggestions for improvements to relevance of planning software to own work
2	Access information	2.1	Identify work processes that require information from planning software system
		2.2	Obtain relevant data and information on current operations from the planning software system
		2.3	Identify the status of items in the value stream
		2.4	Access historical data and information
		2.5	Interpret information and identify and prioritise any actions required in response to information
3	Take appropriate actions in accordance with procedures	3.1	Take actions in response to information obtained from planning software
		3.2	Follow up as appropriate to ensure anticipated results have occurred
		3.3	Record adjustments and variations according to procedures

3.4 Identify any learning needs to use planning software and seek appropriate support

Required Skills and Knowledge

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

Required skills

Required skills include:

- reading and interpreting electronic and hard copy operating instructions and documents, including where used:
 - work instructions
 - standard operating procedures
 - formulas/recipes
 - production and batch sheets
 - temporary instructions
 - other provided operating instructions
- working within access control requirements of the planning software system
- identifying modules, screens, files, and so on, of software relevant to own work
- logging in and using terminals and planning software at a level of access appropriate to own work
- accurately inputting data
- searching and retrieving data
- accessing nominated assistance with planning software

Required knowledge

Required knowledge includes:

- technical knowledge needed to operate own work processes
- planning software system and operation, including:
 - terminal locations and types
 - security and access arrangements
 - range of information held in planning software relevant to own work
 - data collection methods for operations in work area
 - assistance arrangements for users of planning software
 - business activities exercised by/through the planning software system
- value created by operations for customers

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify the scope and relevance of planning software system to their own work • enter and retrieve data, including normal performance and variations • use planning software system to assist in own work • contribute suggestions for improvement to performance and relevance of planning software to own work area.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues

	(third-party reports) • portfolio of evidence In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz)

	• cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Planning software	Planning software includes: • software systems which integrate a range of business information, such as finance, logistics maintenance and production (frequently referred to as ERP, MRP, MRPII or a range of proprietary names)
Relevant data and information	Relevant data and information may include: • technical and other drawings • standard operating procedures and other work instructions • production schedules including historical data • orders and order tracking information • stock control • contact lists • occupational health and safety (OHS) information
Value stream	The value stream begins with the customer and includes all actions (both value-adding and non-value added) by both internal sections/departments and external organisations to meet a customer requirement. Depending on the operations and the customer requirement, stages where value stream actions may occur include: • sales outlet/representative • information gathering, data analysis and research • product design • raw material sourcing • intermediate processing

	• final assembler/collation/preparation • support services (e.g. accounting, finance and legal) • storage and delivery to customer • after market support
Items in the value stream	Items in the value stream refer to information held within the planning software system that contributes to creating value as determined by the customer. Depending on the organisation it may include: • physical elements of the production system, such as sites, work stations, equipment, material, including stock, work in progress and finished products • information needed to meet customer requirements, such as designs, drawings, work instructions, standard operating procedures, standards, material lists and pricing • information not directly related to current customer requirements but required by the organisation
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations Procedures may be: • written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402080A Undertake root cause analysis

Modification History

New unit, superseding MSACMT280A Undertake root cause analysis - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to undertake root cause analysis (RCA) by any person. This will often be undertaken by people working in a team. This unit also covers the competencies needed by operators to contribute to an advanced maintenance strategy using RCA coupled with diagrams and charts.

Application of the Unit

This unit applies to individuals working in an organisation which is applying competitive systems and practices strategies. The unit applies to the formal problem solving to root cause that the individual must undertake in their own work area or where the individual contributes to problem solving to root cause as part of a team.

This unit requires an ability to seek and apply information from a variety of sources in order to inform RCAs. Initiative and enterprise is also required to identify quick fix and permanent solutions to problems.

Where training in a wider range of problem solving techniques and tools is required the unit MSAPMSUP390A Use structured problem solving tools should be selected.

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 performance needed to

essential outcomes of a unit of competency.

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	Recognise problems	1.1	Identify features or occurrences indicative of a problem
		1.2	Use appropriate tools, techniques and charts to define the problem
2	Implement quick fix	2.1	Recommend a quick fix within the scope of competency and authority
		2.2	Use technology or processes relevant to the problem to implement quick fix
3	Determine root cause	3.1	Identify a range of possible causes
		3.2	Gather data and other information to eliminate or confirm possible causes
		3.3	Use available data and information to link causes and effects
		3.4	Seek assistance, as required
		3.5	Identify root cause
4	Develop permanent solution	4.1	Identify a range of methods to eliminate the root cause or break the cause tree
		4.2	Select the most appropriate solution
		4.3	Liaise with relevant people
		4.4	Recommend or implement solution within the limits of competency and authority

- 4.5 Monitor impact of solution and make further recommendations, as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- cooperating and working with others on problem solving
- assessing and recording information from a variety of sources
- defining potential problems factually, including:
 - location and extent of problem or incident
 - sequence of events where relevant
 - extent of deviation from normal operation or performance
- analysing potential problems across a range of varied activities and knowledge applications
- reading and constructing simple charts, such as cause and effect diagrams

Required knowledge

Required knowledge includes:

- RCA methodology, including difference between quick fixes and root cause elimination or breaking of causal tree
- principles and normal operation of equipment, plant and processes in own work area sufficient to undertake a RCA and propose solutions
- common variances to normal performance that are indicators of a problem
- use of relevant analysis tools (e.g. cause/effect diagrams, Pareto charts and 5 Whys)
- operations in own work area

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	A person who demonstrates competency in this unit must

evidence required to demonstrate competency in this unit	be able to provide evidence of the ability to: • undertake problem identification • use appropriate processes to achieve root cause identification • prioritise solutions • recommend solutions and implementation procedures to problems within own area and range of technical skills and knowledge • evaluate implementation of solutions.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess response to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and

	disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree

	Competitive systems and practices should be interpreted so as to take into account: - the stage of implementation of competitive systems and practices - the size of the enterprise - the work organisation, culture, regulatory environment and the industry sector
Features or occurrences indicative of a problem	Examples of features or occurrences indicating problems include: - variation to normal plant or equipment operation - unplanned or non-conforming process or operations outcomes - out of specification products - excess scrap - accidents and emergencies - regulatory breaches - customer returns and complaints - reduction or loss of sales
Root cause	There are many possible causes of any problem. The root cause contrasts with other possible causes of a problem which when eliminated have no impact or only ameliorate the problem. Elimination of the root cause permanently eliminates the problem. There should only be one root cause for any problem and so the analysis should continue until this one cause is found.
Cause tree	The series of causes is referred to as the cause tree. Not all root causes are accessible and able to be eliminated. Breaking the cause tree is such a way that the problem cannot recur is an acceptable alternative. Not all situations can wait for the RCA and eventual elimination of the root cause as there may be serious current impacts. The quick fix will control these immediate impacts, but does not eliminate the root cause.
Quick fix	A quick fix is not a short cut or side step for a permanent solution to the root cause. It is a necessary step designed to control the immediate impacts of a problem, for example, to prevent ongoing errors or to ameliorate damage.
Appropriate techniques/charts	Appropriate techniques/charts may include: - control charts - Pareto charts

	• run charts • flow charts • cause and effect diagrams • tree diagrams • 5 Whys analysis

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402081A Contribute to the application of a proactive maintenance strategy

Modification History

New unit, superseding MSACMT281A Contribute to the application of a proactive maintenance strategy - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to make a positive contribution to proactive maintenance strategies, including actions that contribute to equipment uptime and overall equipment effectiveness (OEE).

Application of the Unit

This unit applies to an individual in an organisation which is following a predictive, preventative or reliability-centred maintenance strategy and which requires commitment from all employees. The employee should 'own' their equipment/plant and take an active part in the implementation of the strategy within the scope of their authority.

This unit requires the application of skills associated with accessing and maintaining equipment/plant documentation, It also requires problem solving, initiative and enterprise to continually monitor and maintain operational performance of equipment/plant used in work role.

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

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

unit of competency. 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	Maintain equipment/plant	1.1	Keep equipment/plant within area of responsibility clean
		1.2	Ensure equipment/plant is serviced and adjusted, as required, in accordance with procedures and own level of responsibility
		1.3	Access manufacturer manuals and specifications, where required, to expand knowledge on the maintenance of equipment/plant
		1.4	Access and update documentation on equipment/plant operation and maintenance as appropriate to workplace procedures
2	Monitor operation of equipment/plant	2.1	Regularly check key conditions of the equipment/plant as defined in workplace procedures
		2.2	Regularly check equipment/plant OEE
		2.3	Note any deviation from conditions specified in procedures
		2.4	Identify any previous occurrences of this deviation
3	Identify deviations and patterns	3.1	Identify any previous occurrences of a deviation
		3.2	Identify any related deviations which have occurred
		3.3	Identify any unusual occurrence which may be related to a deviation
4	Take action appropriate to	4.1	Liaise with relevant people regarding the deviation and the solution

competency and
authority on
deviation

4.2

Implement solution and/or assist with the
implementation of the solution, as appropriate

Required Skills and Knowledge

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

Required skills

Required skills include:

- reading and interpreting electronic and hard copy plant, equipment, and process instructions and documents, including where used:
 - work instructions
 - standard operating procedures
 - workshop manuals and instructions from equipment manufacturers in regards to plant or equipment operation, regular maintenance, troubleshooting, and record of use or production
 - production and batch sheets
 - temporary instructions
 - other provided operating instructions
- examining equipment procedures, products and processes for possible causes of deviations from patterns of normal use
- interpreting OEE rates
- servicing and maintaining plant and equipment consistent with area of responsibility and own technical skills

Required knowledge

Required knowledge includes:

- normal behaviour of the equipment/plant
- indicators of abnormal performance
- principles of operation of plant and equipment sufficient to recognise problems and propose solutions
- appropriate cleaning and adjusting for the equipment/plant/area as required by procedures
- concept of OEE as: $availability \times performance \times quality\ rate$

where:

- availability takes into account losses due to breakdown, set up and adjustments
- performance takes into account losses due to minor stoppages, reduced speed and idling

- quality rate takes into account t losses due to rejects, re-works and start-up waste

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • recognise deviations from normal performance patterns and deal with them appropriately • undertake operational service and maintenance on plant and equipment according to instructions.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports)

	• portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams

	• OEE • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Uptime	Uptime refers to: • the overall availability of the plant – it is the inverse of downtime or the unavailability of the plant. Ideal uptime is 100%
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations Procedures may be: • written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403002A Ensure process improvements are sustained

Modification History

New unit, superseding MSACMS401A Ensure process improvements are sustained - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to ensure that the gains which have been made by using improved methods, processes and equipment are sustained as the new baseline/standard for an area of work and so prevent regression to former practices, or digression to less efficient practices.

Application of the Unit

This unit applies to individuals working in a team or work area who have already implemented competitive systems and practices related improvements in their own work and who must work effectively with others implementing competitive systems and practices to ensure that performance improvement gains are sustained.

The unit is also suitable for individuals who have formal or informal responsibility for the work of others, such as team leaders; individuals, such as senior operators, who must mentor others; or individuals, such as technicians and tradespeople, who must integrate the application of their technical skills with the implementation of competitive systems and practices in an organisation.

The unit can be applied to all areas of an organisation, including production, maintenance, logistics and office functions.

The unit covers the implementation of practices to ensure that process improvements are sustained and opportunities taken to suggest further improvements. If mistake proofing is used as one of the methods for ensuring that process improvements are sustained, the unit MSS403051A Mistake proof a production process should be selected.

Improvement initiatives can be made by any of any number of methods and by teams or individuals. The unit assumes that desired levels of performance or quality are known.

This unit requires the application of skills associated with problem solving, initiative and enterprise, and planning and organising in order to check and monitor the impacts of change. It also requires communication and the ability to work with others to assess the impact of change in own work and on other's work, as well as self-management and learning to adapt improvements according to new information and feedback.

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	Examine previous improvements	1.1	Identify impact of previous process improvements to systems, equipment, operations or products in work area
		1.2	Identify improvements that have not met objectives
2	Ensure corrective actions are implemented	2.1	Identify corrective actions that can be taken on process improvements that have not met objectives
		2.2	Liaise with relevant people associated with the anticipated corrective action
		2.3	Obtain any required approvals
		2.4	Ensure the supply of resources
		2.5	Check impacts of corrective action on occupational health and safety (OHS), quality and environmental systems in work area and take action in accordance with procedures, if required

		2.6	Check that self and others in team or work area have required skills for corrective actions
		2.7	Monitor implementation of corrective action
		2.8	Make required adjustments
3	Verify systems support improvement	3.1	Ensure procedures reflect improvements
		3.2	Check that training and assessment activities in team or work area reflect improvements
		3.3	Liaise with relevant people to ensure their support of the new or modified system/s
4	Audit the change	4.1	Determine an appropriate audit period/cycle
		4.2	Agree relevant measures/indicators for the improvement
		4.3	Measure performance at agreed times using agreed measures
		4.4	Investigate causes of under-performance
		4.5	Take appropriate corrective action to improve performance
		4.6	Re-audit the improvement on an agreed basis

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with others to clarify scope and stage of implementation of competitive systems and practices and contribute suggestions for further improvements in implementation
- examining normal operational procedures in terms of flow and contribution to customer benefit
- planning own tasks, including the impact on others to support competitive systems and

practices implementation

- implementing competitive systems and practices in own work area according to instructions
- identifying waste (muda)
- monitoring competitive systems and practices performance indicators for own work and work area

Required knowledge

Required knowledge includes:

- overall procedures for and process of operations relative to improvements being made
- appropriate measures of performance
- business performance goals sufficient to determine best measures of improved performance

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify process and operational changes as a result of implementation of competitive systems and practices • identify and assess impact of performance improvements in a work area against objectives • identify actions and resources required for further improvements • communicate and negotiate with others on improvements • apply procedures for seeking approvals and reporting non-conformances • determine appropriate period and procedures for monitoring implemented changes.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned,

	currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using some combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Improvement	Improvement may be any change aimed at reducing waste (muda). This unit is not about making the improvements, but ensuring beneficial changes remain in place
Customers	Customers may include: • internal or external customers, including final

	customers, as these should be used as the basis for the identification of value and waste The individual does not need to interface directly with the external customer, but should be able to sufficiently identify customer benefit and customer features in processes and operations of their team and their work area
Suppliers	Suppliers may be: internal or external suppliers and should be sufficiently close to the individual's work as to be easily identifiable The operator does not need to interface directly with external suppliers, but should be provided with sufficient information to enable them to identify supplier contribution to their own work and to customer benefit
Systems	Systems are used to mean any/all of the equipment, processes, procedures and work practices that are used to produce the product. A term often used in this context includes: kaizen - the philosophy of continual improvement that every process can and should be continually evaluated and improved in terms of time required, resources used, resultant quality and other aspects relevant to the process
Resources	Resources for corrective actions may include: - equipment - modifications - consumables - people - suitable work area
Procedures	Procedures may include: - work instructions - standard operating procedures - formulas/recipes - batch sheets - temporary instructions and similar instructions provided for the smooth running of the organisation - good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) and government regulations

	Procedures may be: written, verbal, computer-based or in some other format
Improvements	Improvements include: - techniques for preventing mistakes by designing the operations process, equipment and tools so that an operation literally cannot be performed incorrectly (e.g. baka-yoke) - techniques that generate warning signals were a mistake is about to be performed (poka-yoke) Improvements may be sustained by: - use of technology so that it is impossible to do the job any other way - changes to process or procedures or other changes to the operations system which, if followed, will sustain the change and this unit may be applied to all these situations
Measuring performance	Measuring improvements may include: - personally taking measurements - arranging for measurements to be taken/made by appropriate personnel

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403011A Facilitate implementation of competitive systems and practices

Modification History

New unit, superseding MSACMC411A Lead a competitive manufacturing team - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by individuals who facilitate, lead or mentor others in competitive systems and practices implementation in a work area.

Application of the Unit

This unit applies to people responsible for facilitating others in implementing competitive systems and practices in their work. It may apply to formally designated team leaders or people given special roles in the implementation process that go beyond their own work and which involve guiding, facilitating or mentoring others. The unit applies to competitive systems and practices implementation activities at the work area or section level.

The unit requires an individual to integrate a range of competitive systems and practices knowledge and skills as part of their role. The unit covers assisting others to understand and apply a holistic view of their job and their role within an organisation, including the objectives that must be met as part of competitive systems and practices used by the organisation.

This unit requires the application of skills associated with communication, teamwork, problem solving, initiative and enterprise, planning and organising, and self-management. This unit has a strong emphasis on planning and implementation, and also requires an ability to learn from experience and feed new information back into strategies to improve own performance and that of others.

For implementation of competitive systems and practices techniques in an office, the specialist unit *MSS403006A Facilitate implementation of competitive systems and practices in an office*, should be selected instead of this unit.

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	Facilitate the development of process and competitive systems and practices knowledge	1.1	Ensure necessary technical documentation and information about the process and competitive systems and practices is available
		1.2	Assist and mentor others in accessing information
		1.3	Identify work activities which may inhibit the ongoing development of competitive systems and practices skills and knowledge of others
		1.4	Arrange for the provision of workforce development and training for self and others, as appropriate
		1.5	Encourage others to apply technical knowledge to the improvement process
2	Facilitate commitment to efficiency improvements	2.1	Ensure budgets, operating procedures and other related documentation is available
		2.2	Assist others to apply this information to their work responsibilities

		2.3	Encourage the identification of waste
		2.4	Encourage an environment where efficiency improvements are recommended by fellow employees
3	Encourage a competitive systems and practices approach to work	3.1	Encourage and, where necessary, develop communications between specialists and work group members
		3.2	Lead development of strategies to monitor and deal with identified waste issues
		3.3	Resource and encourage other employees to identify and take appropriate action on potential problems
		3.4	Arrange for workforce development and training for self and others, as required, in relevant competitive systems and practice procedures and techniques
		3.5	Guide others in relating identified problems to the maintenance strategy, and developing any required changes, to ensure awareness, learning and commitment
4	Implement process and organisation improvements	4.1	Plan the implementation of work group suggestions and externally suggested improvements
		4.2	Facilitate commitment to, and involvement in, the implementation planning of improvements and to follow improvements to their conclusion
		4.3	Encourage the application of the 'plan, do, measure, improve, control' approach to the job
		4.4	Arrange for workforce development and training, as required, to facilitate continued involvement by others in improvement processes
		4.5	Involve work group and other key personnel in identification of skill needs and means of skills acquisition to fill any identified gaps

Required Skills and Knowledge

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

Required skills

Required skills include:

- facilitating goals, activities, communications and access to resources, including process mapping
- solving problems
- identifying waste (muda)
- data gathering and analysis
- explaining and leading others in implementation at the work group level of:
 - value stream mapping
 - 5S
 - Just in Time (JIT)
 - mistake proofing
 - process mapping
 - establishing customer pull
 - kaizen and kaizen blitz
 - setting of key performance indicators (KPIs)/metrics
 - identification and elimination of waste (muda)
- communicating effectively to conduct informal and formal meetings, and to relate to personnel at all levels
- providing effective feedback
- effectively encouraging team spirit and morale
- transferring knowledge and skills through informal one-on-one mentoring

Required knowledge

Required knowledge includes:

- information technology systems used in the organisation
- principles of competitive systems and practices and their application to the organisation, including:
 - value stream mapping
 - 5S
 - JIT
 - mistake proofing
 - process mapping
 - establishing customer pull
 - kaizen and kaizen blitz

- setting of KPIs/metrics
- identification and elimination of waste (muda)
- monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP), and proprietary systems, which may be used within the organisation
- methods of gathering data against KPIs, such as:
 - waste walk
 - document tagging
 - tracking/log sheets
 - spaghetti diagrams
 - existing information technology and enterprise resource systems (e.g. SCADA, ERP and MRP)
- facilitation techniques to encourage team development and improvement
- organisational policies, plans and procedures

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify processes and products of their organisation and work area • analyse current and future skill development needs of team • act as an effective communication link between team and internal and external competitive systems and practices specialists and managers • lead team in identifying efficiency improvements and elimination of waste.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to

	the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are

	not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as SCADA software, ERP systems, MRP and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Budgets	Budgets include: • financial • time • materials/products • other business plans which are relevant to the team and the work area
Waste	Waste (also known as muda in the Toyota Production System and its derivatives) is any activity which does not contribute to customer benefit/features in the product. Categories of waste include:

	• excess production and early production • delays • movement and transport • poor process design • inventory • inefficient performance of a process • making defective items • activities which do not yield any benefit to the organisation or any benefit to the organisations customers
Key reliability issues	Key reliability issues include those which are most likely to lead to failure, such as: • cleanliness • poor lubrication • incorrect adjustment • poor training and instructions for employees

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403013A Lead team culture improvement

Modification History

New unit, superseding MSACMC413A Lead team culture improvement - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by a team leader or other person responsible for developing a culture within a team appropriate for supporting competitive systems and practices.

Application of the Unit

This unit applies where an organisation has embarked on competitive systems and practices and a team leader or other responsible person is required to change or improve the team culture to be consistent with that required to maximise the benefits from competitive systems and practices.

This unit requires the application of skills associated with communication, teamwork, problem solving, initiative and enterprise, planning and organising, and self-management in order to provide leadership in a changing team environment. This unit has a strong emphasis on planning and change management, but also requires an ability to learn from experience and feed new information back into strategies to improve performance.

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

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

unit of competency. 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	Facilitate the team's understanding of the competitive systems and practices strategy	1.1	Communicate with all team members the objectives and benefits of the competitive systems and practices strategy
		1.2	Review with team members the techniques and methods that will be used in achieving the competitive systems and practices strategy
		1.3	Using a systems approach, help team members understand how the team fits into the organisation
		1.4	Establish appropriate communication and teamwork within the team and with other teams
		1.5	Develop a work structure with the team that allows for everyone to participate in the application of the competitive systems and practices strategy
2	Facilitate application of knowledge about the importance of controlling variation in competitive systems and practices	2.1	Develop the application of a statistical approach by all team members to all relevant facets of the system with a view to reducing variation
		2.2	Encourage the approach of building quality and ensuring team members assist each other in meeting requirements
3	Facilitate the development of skills and knowledge within the team	3.1	Encourage appropriate training for all team members
		3.2	Involve team members in identification of skill needs and skill gaps, and in development of a strategy for training, skills acquisition and self-improvement so as to ensure awareness, learning and commitment

4	Facilitate the development of commitment within the team to the competitive systems and practices strategy	4.1	Ensure that the team has sufficient resources and adequate equipment available to meet the requirements of the competitive systems and practices strategy
		4.2	Encourage the adoption of continuous improvement
		4.3	Encourage employee acceptance of responsibility for the quality of their own work
		4.4	Provide continuous feedback and communication of progress at all levels in implementing the strategy
		4.5	Involve team members in relating identified problems and opportunities for improvement to the competitive systems and practices strategy, and involve them in developing any required changes, to ensure awareness, learning and commitment
		4.6	Establish and monitor indicators of team culture

Required Skills and Knowledge

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

Required skills

Required skills include:

- identifying and interpreting team quality standards and customer requirements
- identifying the competitive operational practices being implemented by the team
- communicating with others in the team, other team leaders, other employees and external representatives relevant to team competitive systems and practices
- ensuring team awareness of performance against requirements (e.g. through visual management techniques)
- facilitating team competitive systems and practices review activities
- solving problems to root cause
- identifying and accessing sources of assistance if difficulty is experienced with team implementation of competitive systems and practices
- interpreting relevant procedures and instructions
- identifying, analysing and evaluating information from a variety of sources

Required knowledge

Required knowledge includes:

- competitive systems and practices strategies at a broad level, including theoretical concepts of one or more of:
 - six sigma
 - lean manufacturing/lean operations
 - agile manufacturing/agile operations
 - Just in Time (JIT)
 - supply chain management
 - value stream management
 - total quality
 - proactive maintenance
 - elimination of waste
 - Balanced Scorecard
 - 5S housekeeping
 - visual factory/visual operations
- benefits of:
 - standardised work
 - customer pull
 - value stream mapping
- principles of change management

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify the competitive systems and practices used by the team • identify changes to their own work flowing from the implementation of the relevant competitive systems and practices • implement and monitor changes designed to improve team culture • know when and how to seek assistance

	• make suggestions for improvements.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Variation	Variation refers to:

	variation from quality standards and customer requirements as expressed in production or operations schedules and technical specifications
Systems approach	A systems approach enables a person to see how work gets done, the effect of changes and shows the internal/external relationships through which products and services are produced. It may include considerations of the role and requirements of: - customers - suppliers - employees - other value stream members - members of the public and community groups - other external individual, group or organisation - technical processes and equipment - statutory and regulatory requirements, including occupational health and safety (OHS) and environment legislation and regulations - quality standards
Team culture	Team culture change is the extent to which the culture of the team is aligned to the goals of customers and the organisation. Team culture may be monitored by: - surveys - evaluation of toolbox or other regular meetings - direct discussion with team members - monitoring of other indicators (e.g. error rates and absenteeism) - analysis of root cause related to status of team culture
Work structures	The work team structure may vary (e.g. be self-directed, cross-functional, and so on, and should be appropriate to the job)

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403030A Improve cost factors in work practices

Modification History

New unit, superseding MSACMT430A Improve cost factors in work practices - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to evaluate the product or process outcomes of a team in terms of their cost components and to be able to determine, in general terms, the cost impacts of alternative actions.

Application of the Unit

This unit applies to a person who is required to assess the relative costs of alternatives and use this as one of the key factors in decision making. Typical decisions include the efficient organisation of own work and that of others in a work area or within a team and the improvement of throughput and cycle times.

Decisions are made within the scope of the authority of the individual and other employees in the area or team and according to procedures.

This unit primarily requires the application of skills associated with communication and information gathering, teamwork and problem solving to analyse the cost components of work processes. Initiative and enterprise, and planning and organising are also required to identify opportunities for improved cost-efficiency. This unit also requires a degree of self-management and learning to effectively operate and maintain skills and performance.

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	Analyse cost components of work area or team function	1.1	Identify cost components in the product or process
		1.2	Identify costs factors under control of area or employees in the team
		1.3	Identify causes of variability in costs
		1.4	Analyse impact of costs on production or process activities undertaken
2	Improve cost-efficiency of processes and procedures	2.1	Identify methods of improving productivity and/or reducing costs within area or team's responsibility
		2.2	Determine cost/benefit ratio of alternative methods of improving productivity and/or reducing costs
		2.3	Consult with all relevant stakeholders regarding possible changes
		2.4	Recommend changes which will increase productivity and reduce cost and variability
		2.5	Implement recommended changes in consultation with relevant stakeholders

Required Skills and Knowledge

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

Required skills

Required skills include:

- identifying fixed and variable costs in products or processes
- analysing costs and determining those that can be controlled by the individuals in an area or team
- analysing costs over time and identifying variability in cost components
- determining cost/benefit ratios
- communicating and negotiating with others on changes using a variety of mediums

Required knowledge

Required knowledge includes:

- cost components of products made
- costs concepts, such as expense, income and cost/benefit
- major cost contributors to product (e.g. energy, materials, labour and distribution, and so on) depending on the product and process)
- the difference between internally and externally controlled costs
- difference between overhead, labour and consumables

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify the scope of their own work and the team or area work and relate it to the overall flow of work in the organisation • express cost factors in specific terms (e.g. cost per item, process and task) • identify and express cost factors in basic financial terms • analyse variability in costs and recommend improvements • use cost/benefit to select preferred improvement strategies.
Context of and specific resources	Assessment of performance must be undertaken in a

for assessment	workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace project(• suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices, • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Cost components	Cost components may include:

	- fixed and variable costs, such as power/energy, materials, plant and equipment, salary and wages, and office expenses (e.g. telephone) - government taxes and charges
Variability in costs	Variability in costs should be assessed over a suitable time. The time should be sufficient to identify: - fluctuations in variable costs related to different volumes of sales, production or operations - abnormal cost fluctuations due to poor design of product or process, poor scheduling, faults, breakdowns and other waste
Process	Process includes all functions that go to meet customer requirements as well as other required functions (e.g. regulatory related functions). Examples include: - design - production - maintenance - logistics - office processes
Procedures	Procedures may include: - work instructions - standard operating procedures - drawings and specifications - manuals - formulas/recipes - batch sheets - temporary instructions and similar instructions provided for the smooth running of the organisation - good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) - government regulations Procedures may be: - written, verbal, computer based or in some other format
Benefits	Benefits should include: positive benefits as well as negative benefits, such as quality, safety, reliability and similar issues which may be impacted by a cost saving

Unit Sector(s)

Unit sector Competitive systems and practices

Custom Content Section

Not applicable.

MSS403040A Facilitate and improve implementation of 5S

Modification History

New unit, superseding MSACMT440A Lead 5S in a manufacturing environment - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to facilitate the implementation and improvement of the 5S by self and others in a team or work area.

Application of the Unit

This unit applies to individuals who facilitate 5S in a team or work area, including implementation, monitoring and improvement. The facilitation may be undertaken by formally designated supervisory staff, such as team leaders or other individuals in a competitive systems and practices implementation role, who need to provide support and encouragement to others to facilitate the achievement of 5S outcomes in the workplace.

This unit requires the application of skills associated with communication, teamwork, problem solving, initiative and enterprise, planning and organising, and self-management in order to provide leadership in a 5S environment. This unit has a strong emphasis on planning and change management, but also requires an ability to learn from experience and feed new information back into strategies to improve performance.

For planning, implementing and leading the application of 5S in an office environment see unit *MSS403039A Facilitate and improve 5S in an office*.

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	Facilitate the set-up of 5S	1.1	Assist others to determine what are necessary and unnecessary items in the work area
		1.2	Assist others to determine optimum assigned location for all necessary items
		1.3	Liaise with relevant production and occupational health and safety (OHS) personnel in determining optimum locations
		1.4	Assist others to determine optimum location for unnecessary items
		1.5	Assist others to determine 5S schedule
		1.6	Ensure procedures reflect 5S practices
		1.7	Assist others to achieve the required level of skill
2	Facilitate the implementation of 5S	2.1	Ensure procedures reflect 5S practices
		2.2	Assess skill base of team or work group members in 5S and arrange for any required training
		2.3	Ensure that any damage and/or safety risks reported by the team or work group are addressed through correct mechanisms
3	Monitor 5S	3.1	Check work area for 5S implementation as part of normal routine

	3.2	Identify non-conformances
	3.3	Negotiate solutions to non-conformances
4	Improve 5S	
	4.1	Work with others to find areas for improvement
	4.2	Assist others to develop improvement solutions
	4.3	Facilitate the availability of resources required for the improvement solution
	4.4	Facilitate the implementation of the improvement solution

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with other employees and managers to engender commitment to achieving 5S outcomes, conduct formal and informal meetings and to explain 5S and related concepts
- facilitating team or work area goals, activities and communications and accessing resources
- visualising normal operational procedures in terms of flow and contribution to customer outcomes
- planning and prioritising activities
- problem solving to determine potential improvements to the 5S system
- reading and interpreting the application of operating procedures for jobs within team or target work area
- analysing work practices, procedures and 5S principles to facilitate setting up the 5S system and to identify improvements
- identifying gaps in skills and/or knowledge and options to address them

Required knowledge

Required knowledge includes:

- principles and purpose of 5S
- methods of identifying waste in the work area, such as:
 - waste walk
 - document tagging
 - tracking/log sheets
 - spaghetti diagrams
 - existing information technology and enterprise resource systems (e.g. Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems
- organisational policies, plans and procedures
- processes for identifying and addressing skill gaps
- ways of encouraging team members to find and suggest areas for improvement
- methods of identifying and evaluating options and making/recommending improvements
- methods of accessing required resources
- OHS requirements relevant to team and work area

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify the scope of the services and/or functions supplied to and by the team or work area and the deliverables expected by customers, including the ultimate customer • facilitate a systematic approach to implementing 5S • lead and motivate others in achieving 5S outcomes and making improvements to the 5S systems • set up systems for monitoring and improving 5S implementation • manage non-conformances in implementation of 5S.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to:

	• workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as SCADA software, ERP systems MRP and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant

	• good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and Responsible Care) • government regulations Procedures may be: • written, verbal, computer-based or in some other format
5S	5S is a system of work organisation originally developed in Japan based around a close translation of the five stages in the housekeeping approach is: • sort • set in order • shine • standardise • sustain
Sort	Sort involves keeping only what is absolutely necessary for the work processes that comprise the job and includes: • clearing the work area of all non-essential items Non-essential items are items not required to either produce product, conduct process or operations or make required adjustments to equipment during process or operations
Set in order	Set in order includes: • assigning required equipment and materials appropriate locations in the work area
Shine	Shine includes: • keeping the work area clean at all times. This should be carried out to a regular daily schedule against allowed time, usually at the end of the day or of a particular process Cleaning includes: • noting any signs of wear, damage, leakage, safety risks or other issues that require immediate attention
Standardise	Standardising includes: • activities that help maintain the order and the housekeeping standards • using procedures and checklists developed from a procedure

Sustain	Sustain includes: • making sure that daily activities are completed every day regardless of circumstance • undertaking inspections, including: • informal inspections that should be carried out often, at least weekly • generating continuous improvement actions from daily activities • formal inspections that should be carried out at least monthly
Items in work area	Items in work area may include: • tools • jigs/fixtures • materials/components • plant and equipment • manuals • personal items (e.g. bags, lunch boxes and posters) • safety equipment and personal protective equipment • other items which happen to be in the work area
Team	The term team is used to apply to all individuals in the target work area who are involved in the implementation of 5S. The team may or may not be a formally designated team working to a team leader
Work area	The work area includes: • all areas where aspects of the job are performed and that are under the direct control of the employee. In a team environment 5S should be applied to all work areas under the control of the team
Target work area	The target work area may be identified as a physical and/or virtual work space: • used by a person, a team or a cross-functional group • common to part/s of a process or value stream (already defined) • shared by people who undertake a defined procedure or set of procedures • needed to support a particular function
Appropriate place	Appropriate places may include areas designated for: • recycling • rubbish removal

	• staff room/lunch room/kitchen • storage • holding area until status is confirmed
Optimum assigned location	The optimum assigned location may include: • making changes to the layout of furniture, equipment and personnel in order to facilitate the smooth and continuous flow of work through process steps taking into account OHS considerations
Non-conformance	Non-conformance includes: • incorrect or incomplete application of 5S procedures, including any daily tasks, scheduled inspections and continuous improvement procedures

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403041A Facilitate breakthrough improvements

Modification History

New unit, superseding MSACMT441A Facilitate continuous improvement in manufacturing - Not equivalent

Unit Descriptor

This unit of competency covers the knowledge and skills required to facilitate implementation of discrete targeted improvement activities to achieve breakthrough improvements in selected processes, operations or products. Typically this approach is used for improvements in areas of waste identified through value stream mapping.

Application of the Unit

This unit applies to team leaders and others who are providing guidance and support to assist a team of employees to identify improvements that can be implemented to operations, processes or products in a brief intensive project.

The unit also covers ensuring that the improvements are sustained. The process of achieving breakthrough improvements is often called kaizen blitz in lean terminology.

This unit assumes that one or more processes and operations have been mapped.

MSS403033A Map an operational process may also need to be selected if this is not the case.

For facilitation of breakthrough improvements in an office see unit *MSS403043A Facilitate breakthrough improvements in an office*.

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	Prepare for improvement event	1.1 Engage team members in the improvement event 1.2 Identify process or processes to be targeted in the improvement event 1.3 Assist team members to identify how their own roles contribute to value to the customer 1.4 Assist team to identify the boundaries of the event, including any imposed exclusions 1.5 Identify key process indicators and other information required for improvement event 1.6 Identify skill needs for personnel engaged in breakthrough improvement event and arrange for any required training 1.7 Establish communication processes with sponsor and stakeholders
2	Identify improvements	2.1 Assist team to review current processes, operations or products and identify options for radical improvements 2.2 Facilitate team activities and other relevant personnel to evaluate the options and agree on improvements to be made 2.3 Encourage and assist team and others to plan the activities and identify metrics to be monitored 2.4 Facilitate allocation of resources and strategies to manage impact on routine work

3	Facilitate the event	3.1	Assist team to gather baseline data on the selected metrics
		3.2	Assist team to identify and address barriers to making the improvements
		3.3	Monitor team dynamics and facilitate team focus and cooperation
		3.4	Liaise with sponsor to communicate progress and maintain their support
4	Evaluate improvements	4.1	Assist team to gather and interpret data on the metrics
		4.2	Facilitate team activities to evaluate the outcomes of the event
		4.3	Identify causes for areas of poor performance from changes and identify any additional changes to address them
		4.4	Report to sponsor and other stakeholders on the outcomes of the event
5	Embed improvements	5.1	Establish mechanisms to ensure new systems and/or practices are communicated to relevant personnel
		5.2	Motivate team to apply the new systems and/or practices and sustain improvements
		5.3	Ensure the new systems and/or practices are reflected in relevant procedures

Required Skills and Knowledge

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

Required skills

Required skills include:

- facilitating groups of people who may not normally work together
- analysing information and data to identify variation and evaluate improvements
- measuring and calculating performance variables
- facilitating team goals, activities, communications and accessing resources
- planning and prioritising team activities
- solving problems to root cause
- identifying waste (muda)
- communicating with personnel at all levels in relation to team activities and improvement projects
- visualising normal operations and procedures in terms of flow and contribution to customer value
- contributing to procedure review and/or development
- identifying gaps in skills and/or knowledge and options to address them

Required knowledge

Required knowledge includes:

- team and organisation deliverables and processes used to achieve them
- how organisation operations and processes contribute to the value stream
- types of waste (muda) and imposed exclusions
- organisational policies, plans and procedures
- methods of identifying and evaluating options
- occupational health and safety (OHS) requirements relevant to the target work areas

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • interpret operations, processes and products in terms of value to the customer • identify, analyse and evaluate information from a variety of sources to identify opportunities for breakthrough improvements • lead and motivate others in planning, implementing and sustaining improvements.
Context of and specific resources	Assessment of performance must be undertaken in a

for assessment	workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Team	Team for the purposes of this unit means any group of employees engaged in a breakthrough improvement

	event. Examples include: • a permanent formally identified team • a sub-group of a team • a specially established group for the breakthrough event (e.g. a combined production/administration/logistics group convened for a breakthrough event addressing delivery issues)
Scope and benefit statements	Scope and benefit statements of improvement project may include: • description of the business • the target work process • what key stakeholders seek from the improvement project • a mission for the event • a set of goals • a statement of the do's and don'ts for the improvement project
Boundaries	Boundaries define the extent and limits of the breakthrough improvement event. Typically they define: • the start and end point of the process being targeted • the steps of the process to be included and excluded • specific job roles or related processes to be included or excluded • timeframe for the event
Sponsor	Sponsor includes: • a person who is committed to achieving improvements and who has the authority to approve and allocate resources to support the activities and ensuing changes. Typically the sponsor will be a middle or senior manager in the organisation or the business owner
Breakthrough improvement	A breakthrough improvement (also known as kaizen blitz) is one that delivers a better ratio of value-add to non-value add from the customer perspective. It is characterised by: • using a formal process • being a discrete targeted activity that is achieved in a relatively short timeframe • delivering significant level of improvement
Mechanisms	Mechanisms to communicate and sustain improvements may include:

	• scheduled audits • regular monitoring and/or reporting activities • use of visual aids, such as targets and progress boards, process charts and procedure posters • communications, such as standing items for team meetings, email reminders or updates
Imposed exclusions	Imposed exclusions are wastes (muda) that are required but do not add value. They should be formally identified as muda in the competitive systems implementation. Examples include: • equipment excluded from efficiency or layout review because of budget constraints • regulatory requirements that do not add value • organisation requirements, policies or procedures beyond the influence of the team
Key process indicators	Key process indicators may include: • statistical process control data/charts • orders • lost time, injury and other OHS records • equipment reliability charts
Team	Team includes: • formally designated teams • informal groups of employees • other stakeholders who may be brought together for a breakthrough improvement event

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403051A Mistake proof an operational process

Modification History

New unit, superseding MSACMT451A Mistake proof a production process - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to make changes to own and others work in a work area which prevents errors and/or backsliding to a pre-improvement level of practice.

Application of the Unit

This unit applies to a person who needs to analyse a process that a team is responsible for and determine methods of mistake proofing it (e.g. ensuring it only produces product within an acceptable range or error-free transport and storage of goods). The person will typically be a technical expert, team leader or be in a role where they have sufficient technical understanding of processes in their own work and that of others to be able to mistake proof the production process in their area. After improvement activities have been undertaken these improvements need to be sustained.

This unit requires the application of skills associated information gathering and analysis. Initiative, enterprise and problem solving are also required to identify mistakes and determine strategies for eliminating them. This unit also requires communication and teamwork skills to ensure mistake proofing strategies are implemented and self-management and learning skills to continually reflect on and integrate feedback about the effectiveness of strategies.

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	Analyse process	1.1	Identify sources of variability/non-conformance in the process
		1.2	Identify critical control points in process
		1.3	Analyse causes of variability/non-conformance
2	Develop preventative techniques/systems	2.1	Liaise with team members and other people to develop mistake proof options for performing operation
		2.2	Test and validate mistake proofing options
3	Implement permanent fix	3.1	Liaise with relevant people to have systems/procedures changed to implement solution
		3.2	Liaise with relevant people to implement the solution
		3.3	Liaise with relevant people to ensure self and others in the team or work area have an appropriate skills set
		3.4	Follow through to ensure implementation occurs
4	Monitor implementation	4.1	Critically observe the implementation
		4.2	Compare the results of the implementation against the expected outcomes
		4.3	Modify solution to improve outcomes

		4.4	Ensure procedures reflect change
		4.5	Ensure training/assessment reflects change
		4.6	Audit change at agreed period/cycle
		4.7	Take action on any observed deviation
5	Seek improvements	5.1	Observe changes
		5.2	Analyse process again, if required, to ensure improvements are sustained

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with team or work group members, technical support personnel and other relevant staff
- explaining mistake proofing and related concepts
- facilitating input of others and encouraging acceptance of changes
- analysing and visualising operations in terms of flow and contribution to customer outcomes
- solving problems to determine root cause of errors and possible solutions
- analysing and interpreting information about errors and mistake proofing options in terms of cost, feasibility, regulations and value to the customer
- suggesting design changes to operations and products that eliminate the potential for errors
- suggesting mechanisms or procedures that warn of errors where operations cannot be designed to eliminate errors,

Required knowledge

Required knowledge includes:

- mistake proofing concepts, including, in priority order:
 - eliminate the possibility of the error via changes to the process
 - prevent the error from occurring via physical or virtual barriers
 - reduce likelihood of the error by encouraging correct action

- mitigate the impact of the error if it does occur
- understanding of processes undertaken by team
- factors in the processes which may cause variability
- methods of controlling the variability in the process
- mistake proofing methods relevant to the process/product

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • analyse variability and non-conformances • identify, analyse and evaluate information from a variety of sources to identify errors and options for mistake proofing • facilitate implementation of mistake proofing activities that reduce waste • facilitate sustaining the mistake proofing activities.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace

	• workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related

	operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Mistake proofing	Mistake proofing is based on the concept of zero defects. The first priority is to eliminate the possibility of an error occurring. However, where this is not feasible mistake proofing can be used to reduce the occurrence of errors and/or to minimise their impact. Mistake proofing should target an error in the following priority order: • eliminate the possibility of the error via changes to the process • prevent the error from occurring via physical or virtual barriers, • reduce likelihood of the error by encouraging correct action (e.g. through warning systems) • mitigate the impact of the error if it does occur Mistake proofing is also called error proofing or baka-yoke or poka-yoke
Options for mistake proofing	Factors to consider when prioritising options for mistake proofing will vary according to the process and may include: • success rate in eliminating errors

	• feasibility • skills required by employees • cost • capacity to reduce waste
Procedures	Procedures may include: • all work instructions • standard operating procedures • formulas/recipes • batch sheet • temporary instructions and similar instructions provided for the operation of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations Procedures may be: • written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS404060A Facilitate the use of planning software systems in a work area or team

Modification History

New unit, superseding MSACMT460A Facilitate the use of planning software systems in manufacturing* - Not equivalent

* Prerequisite *MSACMT260A Use planning software systems in manufacturing* - removed

Unit Descriptor

This unit of competency covers the skills and knowledge required to facilitate the use of planning software in an organisation in a person's work area or team. These systems are known by various generic names, such as Enterprise Resource Planning (ERP), Materials Resource Planning (MRPII, MRP III etc.) or by proprietary names.

Application of the Unit

This unit applies to a person who will access the planning software system for their own work, but will also need to provide support and organise skill development programs for their team or work group members. The person will typically be a technical expert, team leader or be in a role where they have sufficient technical understanding of processes in their own work and that of others to be able to facilitate the use of the planning software system.

The planning software system will be used routinely in the work of the team or work group.

This unit primarily requires the application of skills associated with using communication technology and supporting team use of planning software. Problem solving, initiative and enterprise, and planning and organisational skills are required to ensure that planning software is used efficiently. This requires aspects of learning and self-management to ensure own performance and that of the team.

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 scope of planning software	1.1	Identify categories of information held by planning software
		1.2	Identify information categories relevant to team and area processes
		1.3	Identify range of information able to be provided to planning software by team or work group
		1.4	Identify range of information able to be provided to team or work group by planning software
2	Communicate using the planning software system	2.1	Send and receive information using planning software
		2.2	Send and receive messages using planning software
3	Make decisions using planning software	3.1	Interrogate the planning software system to find required current, historical or predicted information
		3.2	Take actions appropriate to the information in accordance with procedures
4	Monitor the use of	4.1	Routinely monitor planning software information

	planning software	4.2	Review performance and use of planning software with team
5	Support others to use planning software	5.1	Regularly communicate with team or other work group members, both using planning software and face to face
		5.2	Identify improvements required
		5.3	Take appropriate actions to implement improvements

Required Skills and Knowledge

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

Required skills

Required skills include:

- entering and receiving information via planning software terminals
- communicating with team and organisation planning software support personnel
- engaging and motivating team in use of planning software
- identifying team or work group area information requirements
- identifying scope of information relevant to team and area available in planning software by categories
- planning and organising improvements in team's use of planning software

Required knowledge

Required knowledge includes:

- hierarchy of planning software system and operation
- information available from/through the planning software system
- query facilities and information analysis capabilities offered by planning software
- support/training/skill development mechanisms available for access by team members

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify team or work group area information requirements and relate to planning software categories • lead and motivate others in using planning software • ensure information sent to planning software is accurate and appropriate • obtain regular and one-off information from planning software • make decisions using planning software generated information.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence.

	In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, ERP systems, MRP and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time

	• process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Planning software	Planning software is a general term applied to a number of software systems which integrate a range of business information, such as: • sales/order taking • finance/accounting • logistics • maintenance • human resources • production It is frequently referred to by names such as ERP or MRP/MRP II. In some cases it can be integrated with engineering applications, such as SCADA systems. In such cases the unit MSS402061A Use SCADA systems in operations may also be required
Information and messages	Information and messages able to be sent and received via the planning software will vary between programs and organisations. This unit assumes that a range of discretion is available to the team leader over the information and messages that can be sent or received. Examples of information and message categories include: • orders • production/operations processes • scheduling (e.g. daily/weekly) • finance and accounting • human resources (e.g. rosters, reserves, training completed and scheduled) • quality requirements • customers • suppliers

Value stream	The value stream begins with the customer and includes all actions (both value-adding and non-value added) by both internal sections/departments and external organisations to meet a customer requirement. Depending on the operations and the customer requirement stages where value stream actions may occur include: • sales outlet/representative • information gathering, data analysis and research • product design • raw material sourcing • intermediate processing • final assembler/collation/preparation • support services (e.g. accounting, finance and legal) • storage and delivery to customer • after market support

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS404081A Undertake proactive maintenance analyses

Modification History

New unit, superseding MSACMT481A Undertake proactive maintenance analyses - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to undertake the most common forms of analyses associated with predictive/preventative/reliability centred maintenance strategies.

Application of the Unit

This unit applies to a technical expert (usually an engineer, technician or tradesperson) who is required to undertake analyses for the purpose of predictive/preventative/reliability centred maintenance as part of a competitive systems and practices strategy.

This unit primarily requires the application of skills associated with communication, teamwork, problem solving, initiative and enterprise, and planning and organising in order to undertake maintenance analyses. This is normally done in the context of using computer technology, and requires aspects of learning and self-management to ensure team involvement and facilitation of learning.

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

unit of competency. 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	Liaise with operator	1.1	Establish a relationship with the operator of equipment/plant
		1.2	Ensure the operator has the required skills and resources to keep the equipment/plant clean
		1.3	Ensure the operator is able to effectively monitor the operation of the equipment/plant
		1.4	Regularly communicate with operator about the overall equipment effectiveness (OEE) of their equipment/plant
		1.5	Involve operator, team leader and other key personnel in identification of skill needs and means of skill acquisition to fill any identified gaps
2	Analyse history	2.1	Analyse mean time between failures (MTBF) from maintenance records
		2.2	Analyse performance data of the equipment/plant
		2.3	Identify causes of changes to historic trends/status
		2.4	Determine methods of ensuring causes of improvements and resolution of deterioration are locked in
3	Undertake failure mode effects analysis (FMEA) or similar failure effects analysis	3.1	Undertake analysis
		3.2	Record results of analysis
		3.3	Investigate methods of eliminating possibility of failure and/or minimising the impact of the failure
		3.4	Liaise with operator, team leader and other key personnel regarding possible solutions

		3.5	Select most appropriate solution
		3.6	Implement selected solutions
4	Undertake condition monitoring analysis	4.1	Obtain data for condition monitoring analysis
		4.2	Interpret condition monitoring data
		4.3	Predict required maintenance type and timing from condition monitoring data
		4.4	Liaise with operator, team leader and other key personnel regarding implications of condition monitoring report
		4.5	Involve team members in development of changes to maintenance strategy to ensure awareness, learning and commitment

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with operators and team leaders in a variety of situations and with different media
- adapting personal communication strategy to different levels of operator and team leader literacy and numeracy
- working in formal and ad-hoc teams to undertake proactive maintenance related analyses
- analyse data to determine trends, variations, equipment history and to prioritise methods of eliminating or minimising equipment failure
- solving problems to root cause
- applying basic arithmetic and statistical methods
- planning for effective data collection
- reading and interpreting engineering specifications/drawings
- reading and interpreting charts and diagrams
- using information system terminals and computer
- recording data in hard or soft formats

Required knowledge

Required knowledge includes:

- cleaning needs, techniques and principles of equipment in area of responsibility
- methods of assessing operator and maintenance skill gaps and filling them
- techniques for determining MTBF or similar
- techniques for undertaking FMEA or similar
- underpinning principles of competitive systems and practices strategies being implemented and how to adapt them to maintenance
- root cause analysis
- techniques to analyse condition monitoring data

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify and analyse data and other information on the historical performance of equipment • involve operators, maintenance and other stakeholders in decisions on proactive maintenance strategies • identify root cause of failure and deterioration in equipment performance • select and implement failure elimination or minimisation solutions.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to

	production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations

	• agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • OEE • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
OEE	OEE is the combination of the main factors causing loss of productive capacity from equipment/plant and is: $OEE = availability \times performance \times quality\ rate$ where: • availability takes into account losses due to breakdown, set up and adjustments • performance takes into account losses due to minor stoppages, reduced speed and idling • quality rate takes into account losses due to rejects, reworks and start-up waste

MTBF	MTBF is one key measure of the effectiveness of a maintenance procedure, and is an indicator as to whether root causes are being found and resolved. If MTBF is reducing, then it is an indicator that the maintenance regime is failing. There are many possible causes of any problem. Eliminating some will have no impact, others will ameliorate the problem. However, elimination of the root cause will eliminate the problem. There should only be one root cause for any problem and so the analysis should continue until this one cause is found. Elimination of the root cause permanently eliminates the problem. Depending on the equipment, operations and procedures of the organisation, alternative statistical records of maintenance and maintenance related events may be substituted for MTBF providing they relate strategies for improving OEE.
FMEA	FMEA is a systematic approach that identifies potential failure modes in a system, product, or operations/assembly operation caused by either design or operations/assembly process deficiencies. It also identifies critical or significant design or process characteristics that require special controls to prevent or detect failure modes. FMEA is a tool used to prevent problems from occurring. Some industry sectors have highly adapted forms of FMEA and may practice traditional FMEA in say their routine maintenance while using another technique, such as Hazard and Operability Studies (HAZOP) for design and modification. HAZOP is a form of FMEA which has been practiced by the process industries for over 30 years and examines the implications of changes in process conditions to process stability.
Condition monitoring	In this unit condition monitoring is used to describe the process of analysing the implications of condition monitoring data for proactive maintenance, whether it be obtained from non-destructive testing (NDT) reports, visual assessment by experts, diagnostic reports obtained from SCADA or other enterprise or equipment software and product or process quality analyses. It does not require the actual undertaking of the NDT or condition monitoring assessment or test. If this is required appropriate units from other Training Packages will be

	required.

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS404082A Assist in implementing a proactive maintenance strategy

Modification History

New unit, superseding MSACMT482A Assist in implementing a proactive maintenance strategy - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by a maintenance person to assist in the implementation of a proactive maintenance strategy in an organisation. This unit includes the interaction between a maintenance worker and operators, as appropriate.

Application of the Unit

This unit applies to a maintenance person in an organisation that has adopted or is implementing total preventative/productive maintenance (TPM), reliability centred maintenance (RCM) or similar strategies. As part of this, the maintenance person is expected to assist in the implementation by determining appropriate maintenance related schedules and also by providing maintenance related assistance to non-maintenance personnel, such as assisting production personnel to fulfil their role in the TPM/RCM strategy.

This unit requires the application of skills associated with problem solving and initiative and enterprise in order to analyse maintenance requirements. Communication, teamwork and planning and organising skills will be required to implement reliability strategies. This requires aspects of self-management to ensure improvement of own performance and learning.

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	Develop components of reliability strategy for a work/plant area	1.1	Determine manufacturer's recommended inspection, servicing and related schedules for relevant plant
		1.2	Consult with relevant people with regard to appropriate inspections, services and schedules
		1.3	Discuss any conflicts with relevant people and seek resolution of conflicts
		1.4	Develop schedules in liaison with relevant people
		1.5	Identify inspections and servicing which may be done by operations personnel in liaison with relevant stakeholders
2	Assess current practice for maintenance implications	2.1	Identify the overall equipment effectiveness (OEE) or other organisation targets for equipment/plant
		2.2	Evaluate procedures for plant/equipment reliability implications
		2.3	Discuss current practices with relevant people to determine any plant/equipment reliability implications
		2.4	Recommend changes to improve plant/equipment reliability in accordance with procedures
3	Assist in implementing the reliability strategy	3.1	Arrange for schedules to be incorporated in relevant work plans
		3.2	Identify training needs in discussion with relevant

personnel

- 3.3 Assist personnel to develop required skills for inspections/servicing within scope of authority
- 3.4 Collect data/information as required by own work plan
- 3.5 Compare data/information with performance indicators
- 3.6 Recommend improvements to reliability strategy in accordance with procedures

Required Skills and Knowledge

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

Required skills

Required skills include:

- explaining concepts and processes of chosen proactive maintenance strategy used by the organisation and distinguishing from traditional (breakdown) maintenance strategies
- communicating with operators, other maintenance personnel, team leaders and technical experts in a variety of situations and using different media
- adapting personal communication strategy to different levels of operator and team leader literacy and numeracy
- working in formal and ad-hoc teams to implement proactive maintenance
- solving problems to root cause
- planning proactive maintenance tasks to fit in with maintenance and production schedules and the needs of other staff
- assessing the ability of operations personnel with regard to inspections and servicing of equipment
- reading and interpreting charts and diagrams, manufacturer manuals and specifications and operating procedures

Required knowledge

Required knowledge includes:

- requirements of the proactive maintenance strategy being implemented
- operating principles and procedures for equipment/plant subject to proactive maintenance strategy
- purpose and processes for data collection in proactive maintenance strategies
- procedures relevant to own job and organisation implementation of proactive maintenance

- methods of making/recommending improvements

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • source information from manuals and other technical documentation or software • effectively communicate with users on equipment operational and maintenance history • develop schedules for maintenance activities including seeking technical assistance, where appropriate • differentiate between proactive and traditional maintenance strategies.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation

	• case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and

	analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • OEE • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise, the work organisation, culture • regulatory environment and the industry sector
TPM	TPM is an application of total quality management to maintenance with the intention of increasing reliability, getting it right first time and increasing OEE
RCM	RCM moves maintenance from reactive, or even planned/programmed, towards a focus on uptime and OEE
Similar strategies	Similar strategies may include: • mean time between failure (MTBF) which is one key measure of the effectiveness of a maintenance procedure, and is an indicator as to whether root causes are being found and resolved. If MTBF is reducing, then it is an indicator that the maintenance regime is failing • failure mode and effects analysis (FMEA) which is a systematic approach that identifies potential failure modes in a system, product, or equipment based operations caused by either design or operation/process deficiencies. It also identifies critical or significant design or process characteristics that require special controls to prevent or detect failure modes. FMEA is a tool used to prevent problems from occurring • industry sectors have highly adapted forms of FMEA

	and which may practice traditional FMEA in say their routine maintenance while using another technique, such as Hazard and Operability Studies (HAZOP) for design and modification. HAZOP is a form of FMEA which has been practiced by the process industries for over 30 years and examines the implications of changes in process conditions to process stability condition monitoring which often involves quite sophisticated monitoring of equipment, including such things as vibration monitoring, instrumental analysis of lubricating oil, and so on, to determine the current state of the equipment, monitor the change in this condition and predict when it needs servicing/maintenance to maintain reliability.
OEE	OEE is the combination of the main factors causing loss of productive capacity from equipment/plant and is: $OEE = \text{availability} \times \text{performance} \times \text{quality rate}$ where: - availability takes into account losses due to breakdown, set-up and adjustments - performance takes into account losses due to minor stoppages, reduced speed and idling - quality rate takes into account the losses due to rejects, reworks and start-up waste
Uptime	Uptime refers to the overall availability of the plant (it is the inverse of downtime) or the unavailability of the plant. Ideal uptime is 100%
Inspection	Inspection may include: - reading dials, gauges and meters - observations, including those using sight, hearing, smell and feel - observations of product quality/faults/rejects
Servicing	Servicing may include: - cleaning - lubricating - topping up - adjusting
Procedures	Procedures may include: - work instructions - standard operating procedures

	• formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations Procedures may be: • written, verbal, computer based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

PMC552002C Operate equipment to blend/mix materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the selection and blending/mixing of materials using blending/mixing equipment. It involves loading and unloading equipment, monitoring the process, maintaining a safe work environment and conducting routine maintenance.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for selecting and blending a variety of materials to produce a variety of products. This competency does NOT cover concrete mixing nor asphalt mixing for which the specific competencies <i>PMC552060C Batch mix concrete</i> and <i>PMC552065B Prepare asphalt</i> should be used. If manual handling forms part of this job then regulatory obligations will require competency in <i>PMBHAN103C Shift materials safely by hand</i>. This competency is typically performed by operators working either independently or as part of a work team. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine blend/mix requirements	1.1. Check work schedule/job specification/job card 1.2. Identify customer requirements and set parameters in accordance with standard procedures 1.3. Select correct type and quantity of materials 1.4. Meet all special requirements and specifications 1.5. Identify any material handling problems and take action in accordance with standard procedures 1.6. Update material records as appropriate
2. Control hazards	2.1. Identify hazards from the materials 2.2. Identify other hazards in blending/mixing work area 2.3. Assess the risks arising from those hazards 2.4. Implement measures to control those risks in line with procedures
3. Blend/mix materials	3.1. Set up, start and operate blending/mixing equipment

ELEMENT	PERFORMANCE CRITERIA
	as required by specifications and standard procedures 3.2. Prepare and add materials to blender/mixer as required by specification and standard procedures 3.3. Check that materials prepared match requirements 3.4. Use ancillary equipment as required according to standard procedures 3.5. Ensure equipment is operated in accordance with established enterprise procedures 3.6. Blend/mix materials to obtain required results
4. Monitor and record operation	4.1. Monitor equipment performance in accordance with work instructions and manufacturer's specifications 4.2. Monitor non-conforming product against customer specifications 4.3. Adjust and control equipment to ensure correct product quality 4.4. Complete final inspection checks 4.5. Complete appropriate records and logs
5. Rectify routine problems	5.1. Identify the range of faults that can occur during the operation 5.2. Determine and rectify fault causes in accordance with procedures/work instructions 5.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 5.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 5.5. Identify non-routine problems and report to designated person
6. Maintain blending/mixing plant and area	6.1. Keep area and equipment clean and in good order 6.2. Unload and shut down equipment as required 6.3. Respond to routine faults according to enterprise procedures 6.4. Report non-routine faults according to enterprise procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification product
- implementing the enterprise's procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- hazards associated with the process
- application of the hierarchy of control in controlling the hazards
- selection, use and maintenance of relevant personal protective equipment (PPE)
- material handling requirements
- principles of blending/mixing these products
- impact of variations in materials on final product
- impact of blending/mixing on final product
- impact of variations in product specification of the blending/mixing process
- properties of the mix
- equipment limitations and impact on blending/mixing efficiency and effectiveness
- enterprise production schedules
- underlying causes of faults such as precipitated by:
 - material
 - equipment
 - blending/mixing time/technique

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	The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that the equipment be understood and that the importance of critical material properties, settings and readings is known. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • hazards are identified and controlled • blend/mix properties are kept within limits • quality is monitored to minimise wastage • process measurements/observations are continually made • all OHS requirements are followed • problems are anticipated and appropriate action is taken (i.e. problem fixed or reported).
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation or case studies/scenarios may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual plant and will include 'walk-throughs' of the relevant competency components. A bank of scenarios/case studies/what ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

EVIDENCE GUIDE	
	It may also be appropriate to assess this unit in conjunction with: MSAC112003A Undertake manual handling. Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.
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

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 standard procedures and work instructions.
Equipment and unit operations	All such items of equipment and unit operations must form part of a discrete blending/mixing system. These may include: - pumps (lubrication and cooling pumps) - utilities and services - heat exchangers (intercoolers) - vibration monitoring - other equipment integral to the operation of the compressor system
Typical problems	Typical problems may include: - equipment malfunction - material handling such as equipment failure and blockages - material property variation - blend/mix tolerance - uniform dispersion of minor

RANGE STATEMENT	
	ingredients/additives • blending/mixing to special requirements/colour • mixing sequence • matching mixes produced with production requirements • monitoring and adjusting process conditions • recognising and acting on potential and actual problems • quality problems including customer requirements
Occupational health and safety (OHS)	All operations are subject to stringent OHS requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OHS requirements, the OHS requirements take precedence

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC552003C Operate grinding equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the grinding and size reduction of raw materials, materials in process, product and scrap/recycled material. It involves monitoring the process, ensuring a safe work environment, rectifying problems and facilitating output changes.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for preparing materials for grinding; grinding materials and distributing ground materials. This competency is typically performed by operators working either independently or as part of a work team. At all times they would be liaising with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to grind materials	1.1. Check equipment for hazards, danger and isolation tags in accordance with standard operating procedures 1.2. Perform checks to ensure all doors, inspection openings and guards are in position and secure 1.3. Make adjustments to equipment settings to ensure conformance with standard operating procedures 1.4. Notify appropriate personnel of intention to start equipment 1.5. Conduct additional pre-start checks as required in accordance with standard operating procedures 1.6. Ensure an adequate supply of materials is available to meet production requirements
2. Grind materials	2.1. Start equipment in sequence in accordance with standard operating procedures 2.2. Monitor instrument/control panels and adjust as necessary to remain within specified operating parameters 2.3. Make physical inspections of plant and equipment at specified intervals to identify any anomalies in standard operating procedures 2.4. Maximise product throughput and efficiency to maintain target parameters

ELEMENT	PERFORMANCE CRITERIA
	2.5. Communicate with appropriate personnel regarding the status of operations in line with enterprise requirements 2.6. Employ safe working practices which conform with occupational health and safety (OHS) and enterprise requirements 2.7. Shut down equipment in accordance with procedures and complete required records
3. Rectify routine problems	3.1. Identify the range of faults that can occur during the operation 3.2. Determine and rectify faults caused by procedures 3.3. Identify and rectify equipment failure causes in accordance with procedures 3.4. Make sure appropriate records and log books of equipment operations are maintained to meet procedures 3.5. Identify non-routine problems and report to designated person
4. Distribute ground product	4.1. Distribute ground materials to their correct silo/storage area in accordance with standard operating procedures 4.2. Monitor silo/storage areas to ensure compliance with enterprise storage quality/quantity requirements.
5. Control hazards	5.1. Identify hazards in the grinding work area 5.2. Assess the risks arising from those hazards 5.3. Implement measures to control those risks in line with procedures 5.4. Shut down in an emergency as required

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- recognising process conditions which will lead to out of specification production and taking appropriate action

REQUIRED SKILLS AND KNOWLEDGE

- implementing the enterprise's standard procedures and work instructions and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the operation of grinding equipment
- reading and numeracy is required to the level of interpreting workplace documents and technical information

Required knowledge

Required knowledge includes:

- startup and shutdown processes
- construction and limitations of the grinding equipment and conditions
- grinding fundamentals
- out of specification situations
- physics and chemistry (where appropriate) of process
- principles of operation of process
- control philosophy of process
- distinguish between causes of faults such as:
 - raw material variations
 - mechanical abnormalities
 - electrical/instrument reading variations

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

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

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

It is essential that the equipment and process be understood and that the importance of critical material properties is known.

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in reporting the condition to the appropriate individual.

Consistent performance at the required standard should

EVIDENCE GUIDE	
	be demonstrated. In particular look to see that: • types of materials to be ground and their additives are identified • individual material feed and distribution systems are understood • OHS and safe work practices are followed • signage, tags and isolation procedures are followed • basic maintenance and inspection practices are carried out. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation or case studies/scenarios may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual plant and will include 'walk-throughs' of the relevant competency components. A bank of scenarios/case studies/what ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.
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

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.	
Procedures	All operations are performed in accordance with standard procedures and work instructions.
Ground materials	Ground materials may include: • quarried materials • cement clinker • lime • ceramics and clay • ground minerals • glass • concrete waste • fibre cement
Equipment and unit operations	All such items of equipment and unit operations which form part of the grinding system. These may include: • ball mills • hammer mills • roller mills • pans • edge mills • other equipment integral to the operation of the grinding system
Typical problems	Typical problems may include: • out of specification grinding media • variations in temperature and moisture • variations in feed • product discharge problems
OHS	The identification and control of hazards and the application of OHS is to be in accordance with current, applicable legislation and regulations, and company procedures. All work is carried out at all times in accordance with these requirements

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC552008B Operate crushing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the crushing and screening of raw materials, materials in process, product and scrap/recycled material. It involves operating crushing equipment, monitoring the process, ensuring a safe work environment and solving routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for the crushing and screening of materials. This competency is typically performed by operators working either independently or as part of a work team. At all times they would be liaising with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to crush materials	1.1. Check equipment for hazards, danger and isolation tags in accordance with standard operating procedures 1.2. Perform checks to ensure all doors, inspection openings and guards are in position and secure 1.3. Make adjustments to equipment settings to ensure conformance with standard operating procedures 1.4. Notify appropriate personnel of intention to start equipment 1.5. Conduct additional pre-start checks as required in accordance with standard operating procedures 1.6. Ensure an adequate supply of materials is available to meet production requirements
2. Crush materials	2.1. Start equipment in sequence in accordance with standard operating procedures 2.2. Monitor instrument/control panels and adjust equipment/ controls/feed as necessary to remain within specified operating parameters 2.3. Make physical inspections of plant and equipment at specified intervals as required by standard operating procedures 2.4. Maximise product throughput and efficiency to maintain target parameters

ELEMENT	PERFORMANCE CRITERIA
	2.5. Check screens and screened material to procedures 2.6. Communicate with appropriate personnel regarding the status of operations in line with enterprise requirements 2.7. Make adjustments as appropriate to achieve required output 2.8. Employ working practices which conform with occupational health and safety (OHS) and enterprise requirements 2.9. Distribute material as required
3. Rectify routine problems	3.1. Identify the range of faults that can occur during the operation 3.2. Determine and rectify fault causes by procedures/work instructions 3.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 3.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 3.5. Identify non-routine problems and report to designated person
4. Control hazards	4.1. Identify hazards in the crushing work area 4.2. Assess the risks arising from those hazards 4.3. Implement measures to control those risks in line with procedures and duty of care

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- recognising process conditions which will lead to out of specification production and taking appropriate action
- implementing enterprise's standard procedures and work instructions and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the operation of the crushing equipment

REQUIRED SKILLS AND KNOWLEDGE

- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- startup and shutdown processes
- construction and limitations of the crushing equipment and conditions
- crushing fundamentals
- out of specification situations
- physics and chemistry (where appropriate) of process
- principles of operation of process
- principles of control of process
- distinguish between causes of faults such as:
 - raw material variations
 - mechanical abnormalities
 - electrical/instrument reading variations

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

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

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

It is essential that the equipment and process be understood and that the importance of critical material properties is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in reporting the condition to the appropriate individual.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- types of materials to be crushed are identified
- individual material feed and distribution systems are understood
- OHS and safe work practices are followed

EVIDENCE GUIDE	
	- signage, tags and isolation procedures are followed - basic maintenance and inspection practices are carried out. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation or case studies/scenarios may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual plant and will include 'walk-throughs' of the relevant competency components. A bank of scenarios/case studies/what ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.
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

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 standard procedures and work instructions

RANGE STATEMENT	
Materials	Materials may include: • quarried materials • feedstock • waste materials • ground minerals industries • concrete waste
Equipment and unit operations	This unit of competency includes all such items of equipment and unit operations which form part of the crushing system. These may include: • jaw crushers • cone crushers • grizzlies • grids • other equipment integral to the operation of the crushing system
Typical problems	Typical problems may include: • difficult material to be crushed • variations in temperature and moisture • variations in feed • product discharge problems • blocked screens • oversized feed
OHS	All operations are subject to stringent OHS requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OHS requirements, the OHS requirements take precedence

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC562070B Move materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the movement of materials around sites using front end loaders, hoists and other load shifting equipment. Licensing or certification may be required by local Worksafe or other regulatory authorities.

Application of the Unit

Application of the unit	This unit of competency is typically performed by an experienced operator working either independently or as part of a work team. It will be necessary to have the licence required by government regulation where the type of load shifting equipment is regulated. This unit has the prerequisite competency of any licence required by government regulation. This unit includes: • planning the correct method to move the goods • safely securing the materials/goods to be shifted • ensuring that the movement pathway is clear of obstacles and personnel • moving the goods safely without damage to the goods, personnel or equipment. This unit does NOT apply to the operation of a forklift truck - see TLID107C Operate a forklift, nor does it apply to the use of cranes and gantries - see MSAPMSUP205A Transfer loads.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Perform pre-start checks	1.1. Perform pre-start checks of all plant/equipment in strict accordance with manufacturer's and enterprise requirements 1.2. Inspect, activate and check for safe operation all plant/ equipment attachments consistent with standard operating procedures
2. Plan work load	2.1. Inspect work areas to identify hazards and implement the appropriate prevention/control measures 2.2. Take appropriate precautions to safeguard all

ELEMENT	PERFORMANCE CRITERIA
	site/non-site personnel 2.3. Erect signs and barricades, appropriate to the task, to conform with enterprise safety requirements 2.4. Select for the specific task appropriate personal protective equipment (PPE) in accordance with standard operating procedures 2.5. Inspect work area to determine appropriate path for the movement of vehicular traffic 2.6. Ensure work permits are issued and received by authorised personnel as/when required in accordance with standard operating procedures 2.7. Confirm job requirements and expectations with relevant personnel 2.8. Clarify non-standard requirements 2.9. Accurately identify materials to be moved 2.10. Identify and clarify material movements required
3. Shift loads	3.1. Accurately assess weight of load by specified methods to ensure compliance with equipment load plate specifications 3.2. Use the appropriate process/equipment to shift loads 3.3. Observe all regulatory (state governing body) requirements regarding shifting loads 3.4. Smoothly and consistently move controls and vehicle/equipment within safe operating practices/limits 3.5. Use standard communication signals to coordinate safe movement of load 3.6. Stack loads to enterprise specific requirements, ensuring the stability of the stack without creating a hazard to personnel and equipment 3.7. Use appropriate equipment attachments to perform tasks according to standard enterprise procedures 3.8. Effectively perform emergency evasive action should the need arise
4. Close down plant/equipment	4.1. Close down plant/equipment in accordance with standard operating procedures 4.2. Park/store and secure plant/equipment to conform with enterprise specific requirements 4.3. Perform post-operational checks in strict accordance with manufacturer's requirements and standard

ELEMENT	PERFORMANCE CRITERIA
	operating procedures 4.4.Clean down plant/equipment and dispose of waste following established procedures 4.5.Complete all record keeping/logs/paperwork as required

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- recognising potential problems and to take actions appropriate for those problems
- implementing regulatory and vehicle requirements, the enterprise's standard and safe operating procedures and work instructions and relevant regulatory requirements, within appropriate time constraints and in a manner relevant to the operation of the equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- the determination of mass/weight of loads
- stacking and/or storing practices
- observation of all state and regulatory requirements
- safe and efficient transfer of loads
- distinguishing between:
 - types of materials being moved
 - locations and destinations of materials moved
 - causes of defects and faults

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	The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that the equipment and process material needs be understood and that the importance of critical material properties is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • all pre-start checks are completed • appropriate paths for movement of vehicles/equipment are used • all actions are performed safely • problems are identified and appropriate action is taken (the problem is fixed or reported) • the correct material is delivered to the correct place in the correct amounts and at the correct time. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.
Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation or case studies/scenarios may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual plant and will include 'walk-throughs' of the relevant competency components. A bank of scenarios/case studies/what ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.

EVIDENCE GUIDE**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**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 standard procedures and work instructions

Variations

This unit may vary between enterprises depending upon:

- type of equipment used such as:
 - scrapers and tractors
 - cleaning equipment and sweepers
 - front end loaders
 - hoists
 - pallet shifters
 - specialised loading equipment
- type of materials moved

Typical problems

Typical problems may include:

- equipment malfunctions
- determining safe routes
- scheduling of movements to suit production requirements
- differing load shifting requirements
- changing priorities over the shift

Paperwork

Paperwork may include:

- electronic versions of instructions
- records

RANGE STATEMENT**Occupational health and safety (OHS)**

All operations are subject to stringent OHS requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OHS requirements, the OHS requirements take precedence

Unit Sector(s)**Unit sector**

Support

Competency field**Competency field****Co-requisite units****Co-requisite units**

TAEASS301B Contribute to assessment

Modification History

Version	Comments

TAEASS301B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to contribute to the assessment process.

Application of the Unit

This unit typically applies to a person with technical or vocational expertise who is in a supervisory or mentoring/coaching work role and for whom collecting evidence for assessment is an adjunct to principal work responsibilities.

This unit is performed under the following conditions:

- the necessary assessment tools and assessment resources to guide the evidence collection process have been provided
- any adjustments to tools are determined by the qualified assessor (as defined by the Australian Quality Training Framework and the assessor requirements of the relevant training package), who provides guidance and supervision.

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

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. Clarify role and responsibilities in the assessment process	1.1 Discuss and confirm <i>purpose of assessment</i> with <i>relevant people</i> 1.2 Discuss and confirm <i>benchmarks for assessment</i> with qualified assessor 1.3 Access, read and clarify <i>assessment plan</i> with qualified assessor 1.4 Discuss and agree with qualified assessor the specific responsibilities in gathering evidence and types of evidence to be gathered
2. Confirm organisational arrangements for evidence gathering	2.1 Access and confirm relevant <i>assessment system policies and procedures</i>; organisational, legal and ethical requirements; and other relevant advice on assessment 2.2 Clarify nominated <i>assessment tools</i> and methods for collecting evidence with qualified assessor, to ensure that procedures to be followed and instruments to be used are clear 2.3 Discuss and confirm with relevant people <i>assessment context</i>, including candidate's characteristics and any need for <i>reasonable adjustments</i> 2.4 Confirm and arrange <i>resource requirements</i> in consultation with relevant people
3. Collect evidence in accordance with the assessment plan	3.1 Explain assessment process to candidate, including the different responsibilities of the parties involved, and refer any candidate issues or concerns to qualified assessor prior to undertaking assessment activities 3.2 Use <i>assessment instruments</i> to gather quality evidence within available time and resources, according to organisational, legal and ethical requirements
4. Record and report findings	4.1 Organise and provide evidence to the qualified assessor in a format suitable for analysis according to assessment system policies and procedures

	4.2 Actively seek feedback from the qualified assessor on whether evidence-gathering activities meet the principles of assessment and whether evidence collected meets the rules of evidence 4.3 Document areas for improvement in collecting evidence, for future assessment activities

Required Skills and Knowledge

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

Required skills

- observation skills to observe candidate performance
- cognitive and interpretation skills to ensure collection of valid and reliable evidence
- organisational skills to collect evidence
- time-management skills to schedule assessment events and activities
- literacy skills to:
 - read and interpret relevant information
 - prepare required documentation and collate evidence in required format
- communication skills to:
 - discuss evidence-gathering processes with practitioners and candidates
 - provide constructive and supportive feedback
 - ask appropriate questions to clarify and confirm instructions for evidence gathering
 - provide clear and concrete options and advice.

Required knowledge

- competency-based assessment, including:
 - criterion referenced
 - competency standards as the benchmarks for assessment
 - competency-based reporting
- principles of assessment
- rules of quality evidence
- different purposes of assessment
- diversity of assessment contexts
- evidence, including different types of evidence
- evidence-gathering methods – what are assessment methods and different types of methods
- purpose and features of assessment tools and assessment plans
- potential barriers and processes relating to evidence-gathering procedures and assessment processes
- organisational assessment system policies and procedures relevant to this unit of competency

- technical or subject area being assessed
- 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
- OHS relating to the work role, and OHS considerations to be included in collecting evidence, including:
 - hazard identification and risk control measures
 - requirements for reporting hazards and incidents
 - emergency procedures
 - procedures for use of relevant personal protective equipment
 - safe use of relevant equipment
 - sources of OHS information
 - role of key workplace personnel
 - responsibilities of learners.

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	Evidence of the ability to: • carry out a minimum of three evidence-gathering activities, with different candidates for each activity • present documentation of the evidence in a clear and concise manner • present documented feedback from others involved in the assessment.
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	

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.

Purpose of assessment may be:	• recognise current existing competency of candidates • determine if competency has been achieved following learning • establish candidate progress towards achievement of competence • determine language, literacy and numeracy needs of candidate • certify competence through a Statement of Attainment • establish progress towards a qualification • determine training gaps of candidate • measure work performance • classify employee and support career progression • meet organisational requirements for work, such as operating equipment or developing new skills • satisfy licensing or regulatory requirements.
Relevant people must include:	• qualified assessors • candidates.
Benchmarks for assessment:	• refer to criteria against which candidate is assessed • may be a competency standard/unit of competency, assessment criteria of course curricula, performance specifications, or product specifications.
Assessment plan must include:	• purpose and aims of assessment • context of assessment • relevant benchmarks for assessment • other assessment information and documentation identified as relevant.
Assessment system policies and procedures may include:	• candidate selection • rationale and purpose of competency-based assessment • assessment records, data management and information management • recognition of current competency, recognition of prior learning and credit arrangements.
Assessment tools include:	• 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.
Assessment context may include:	- environment in which assessment will be carried out - relationship between units of competency and candidate's workplace - time period over which assessment takes place.
Reasonable adjustments may include:	- taking into account candidate's language, literacy and numeracy requirements - providing personal support services, such as arranging for: - member of the community to accompany the candidate - reader - interpreter - attendant carer - scribe - using adaptive technology or special equipment - providing flexible assessment sessions to allow for such things as fatigue or administering of medication - format of assessment materials, such as: - in Braille - in first language - use of audiotape or videotape - making adjustments to the physical environment - revising proposed assessment methods and instruments - considering age and gender - considering cultural beliefs, traditional practices and religious observances.
Resource requirements may include:	- resources specific to evidence-gathering activities - access to assessors - access to policy and procedures - access to subject and technical experts - OHS requirements - plant, equipment and technology.
Assessment instruments may include:	- instruments developed by an assessor as part of formative or summative assessment activities, including: - 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.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS401B Plan assessment activities and processes

Modification History

Version	Comments

TAEASS301B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>

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

<i>Elements describe the essential outcomes of a</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text</i>

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	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> 1.2 Identify and access <i>benchmarks for assessment/RPL</i> and any specific assessment guidelines
2. Prepare the assessment plan	2.1 Determine evidence and <i>types of evidence</i> needed to demonstrate competence, according to the <i>rules of evidence</i> 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 2.3 Document all aspects of the <i>assessment plan</i> and confirm with relevant personnel
3. Develop assessment instruments	3.1 Develop <i>simple assessment instruments</i> to meet target group needs 3.2 Analyse <i>available assessment instruments</i> for their suitability for use and modify as required 3.3 <i>Map assessment</i> instruments against unit or course requirements 3.4 Write clear instructions for candidate about the use of the instruments 3.5 Trial draft assessment instruments to validate content and applicability, and record outcomes

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	• Evidence of the ability to: • plan and organise the assessment process on a minimum of two occasions • collect evidence that demonstrates: • 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	Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided. Assessment must ensure access to training products, such as training packages and accredited course documentation.
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.

Purposes of assessment/ RPL may include:	• 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.
Context of assessment/ RPL may include:	• 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 • work activities in the candidate's workplace • learning activities • who carries out the assessment/RPL.
Organisational, legal and ethical requirements may include:	• 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: • anti-discrimination • equal employment opportunity • job role, responsibilities and conditions • relevant industry codes of practice • confidentiality and privacy requirements • OHS considerations, including: • ensuring OHS requirements are adhered to during the

	assessment process identifying and reporting OHS hazards and concerns to relevant personnel.
Benchmarks for assessment/RPL may include:	- criterion against which the candidate is assessed or prior learning recognised, which may be: - competency standard/unit of competency - assessment criteria of course curricula - performance specifications of an enterprise or industry - product specifications.
Types of evidence may include:	- direct - indirect - supplementary.
Rules of evidence ensure that evidence collected is:	- valid - sufficient - authentic - current.
Assessment methods are the particular techniques used to gather evidence and may include:	- direct observation, for example: - real work/real time activities at the workplace - work activities in a simulated workplace environment - structured activities, for example: - simulation exercises and role-plays - projects - presentations - activity sheets - questioning, for example: - 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: - 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: - testimonials and reports from employers and supervisors

	- evidence of training - authenticated prior achievements - interview with employer, supervisor, or peer.
Assessment plan may include:	- overall planning document describing: - what is to be assessed - when assessment is to take place - where assessment is to take place - how assessment is to take place.
Simple assessment instruments may include:	- instruments developed by an assessor as part of formative or summative assessment activities, including: - 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.
Available assessment instruments may include:	- commercially available instruments - those created by others inside the registered training organisation.
Map assessment means:	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

TAEASS402B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>

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	PERFORMANCE CRITERIA

<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>

Elements and Performance Criteria

1. Prepare for assessment	1.1 Interpret assessment plan and confirm organisational, legal and ethical requirements for conducting assessment with relevant people 1.2 Access and interpret relevant benchmarks for assessment and nominated assessment tools to confirm the requirements for evidence to be collected 1.3 Arrange identified material and physical resource requirements according to assessment system policies and procedures 1.4 Organise specialist support required for assessment 1.5 Explain, discuss and agree details of the assessment plan with candidate
2. Gather quality evidence	2.1 Use agreed assessment methods and instruments to gather, organise and document evidence in a format suitable for determining competence 2.2 Apply the principles of assessment and rules of evidence in gathering quality evidence 2.3 Determine opportunities for evidence gathering in actual or simulated activities through consultation with the candidate and relevant personnel 2.4 Determine opportunities for integrated assessment activities and document any changes to assessment instruments where required
3. Support the candidate	3.1 Guide candidates in gathering their own evidence to support recognition of prior learning (RPL) 3.2 Use appropriate communication and interpersonal skills to develop a professional relationship with the candidate that reflects sensitivity to individual differences and enables two-way feedback 3.3 Make decisions on reasonable adjustments with the candidate, based on candidate's needs and characteristics 3.4 Access required specialist support in accordance with the assessment plan 3.5 Address any OHS risk to person or equipment immediately
4. Make the assessment decision	4.1 Examine collected evidence and evaluate it to ensure that it reflects the evidence required to demonstrate competence 4.2 Use judgement to infer whether competence has been demonstrated, based on the available evidence 4.3 Make assessment decision in line with agreed assessment procedures and according to agreed assessment plan 4.4 Provide clear and constructive feedback to candidate regarding

	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 consultation 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	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • 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: • 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

	- 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:	- overall planning, describing: - 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>	- 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:	- 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.

Specialist support may include:	• 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.
Assessment methods include:	• particular techniques used to gather different types of evidence, such as: • direct observation • structured activities • oral or written questioning • portfolios of evidence • review of products • third-party feedback.
Individual differences may include:	• 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.
Feedback may include:	• 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.
Consultation may involve:	• 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

TAEASS403B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>

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

<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>

Elements and Performance Criteria

1. Prepare for validation	1.1 Discuss and confirm the approach to validation according to defined purposes, context, and relevant assessment system policies and procedures 1.2 Analyse relevant benchmarks for assessment and agree on the evidence needed to demonstrate competence 1.3 Arrange materials for validation activities
2. Contribute to validation process	2.1 Demonstrate active participation in validation sessions and activities using appropriate communication skills 2.2 Participate in validation sessions and activities by applying the principles of assessment and rules of evidence 2.3 Check all documents used in the validation process for accuracy and version control
3. Contribute to validation outcomes	3.1 Collectively discuss validation findings to support improvements in the quality of assessment 3.2 Discuss, agree and record recommendations to improve assessment practice 3.3 Implement changes to own assessment practice, arising from validation

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	Evidence of the ability to: • 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	Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided. Assessment must ensure access to: • assessment reports and records • other documentation relevant to validation.
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.

Assessment system policies and procedures may include:	• 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.
Benchmarks for assessment:	• refers to criterion against which the candidate is assessed • may be one or more units of competency or assessment criteria of course curricula.
Materials may include:	• 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.
Validation activities may include:	• analysing and reviewing: • assessment tools • collected evidence • assessment decisions and records of assessment outcomes

	• other aspects of assessment policies, processes and outcomes • recording evidence of validation processes and outcomes.
Participation may include comparison and evaluation of:	• 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.

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.

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.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. 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 measures to ensure learners are acquiring and can use new technical and generic skills and knowledge 3.2. Monitor learner progress and outcomes in consultation with 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:	• language, literacy and numeracy levels • learning styles • past learning and work experiences • specific needs • workplace culture.
<i>Safe learning environment</i> may include:	• exit requirements • personal protective equipment • safe access • safe use of equipment.
<i>Instruction and demonstration objectives</i> may include:	• competencies to be achieved • generic and technical skills, which may be: • provided by the organisation • developed by a colleague • individual or group objectives • learning outcomes.
<i>Learning resources</i> may include:	• any material used to support learning, such as: • 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:	• handouts for learners • materials sourced from the workplace, e.g. workplace documentation, operating procedures, and specifications.
<i>Details</i> may include:	• 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:	• 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:	• coaching • demonstration • explanation • group or pair work • providing opportunities to practise skills and solve problems • questions and answers.
<i>Coaching</i> may include:	• 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:	• informal review or discussion • learner survey • on-the-job observation • review of peer coaching arrangements.

Unit Sector(s)

Unit sector	Delivery and facilitation

Competency field

Competency field	

Co-requisite units

Co-requisite units		

UEPOPS319B Operate and monitor gas production plant

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit deals with the skills and knowledge required to operate, inspect and monitor gas producing plant.

Application of the Unit

Application of the Unit 2)

This unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit do not require a licence to practise in the workplace. However, practice in this unit is subject to regulations directly related to Occupational Health and Safety and where applicable contracts of training such as apprenticeships

Pre-Requisites

Prerequisite Unit(s) 4)

Competencies 4.1)

Prerequisite Unit(s) 4)

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must have been completed.

There are no pre-requisite units

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following levels. A description of what each level entails is provided in Section 2.3.1 Language, Literacy and Numeracy.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information**Employability Skills 5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element.
Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Plan and prepare work	1.1 Safety issues are identified to comply with enterprise/site requirements
	1.2 Work requirements are identified from relevant personnel and documentation
	1.3 Documentation to determine plant status is assessed and evaluated
	1.4 Localised plant inspection and field preparation for service are carried out in accordance with manufacturer and enterprise procedures
	1.5 Plant operational pre-requisites are established in accordance with manufacturer and enterprise procedures
	1.6 Sequence for recommissioning of plant is determined to suit existing circumstances in accordance with enterprise/site requirements
	1.7 Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
2 Operate plant	2.1 Plant is operated in accordance with enterprise and manufacturer operating procedures
	2.2 Plant is monitored and observed to detect deviations from normal operating conditions
	2.3 Corrective actions taken to rectify abnormalities in accordance with manufacturer and enterprise procedures
3 Test plant operation	3.1 Tests are performed in accordance with defined procedures applicable to the operational test
	3.2 Plant is observed for correct operational response
	3.3 Corrective action is taken when response is not in accordance with documentation, plant integrity or personnel safety requirements

ELEMENT	PERFORMANCE CRITERIA
	3.4 Plant is returned to required operational status upon completion of test
4 Analyse plant faults	4.1 Causes of abnormal plant operating conditions are identified by analysing the technical and operational information in a logical and sequential manner
	4.2 Corrective action taken is in accordance with enterprise/site procedures
	4.3 Plant integrity and personnel safety is maintained through consultation with appropriate personnel, and with reference to plant, technical and operational documentation
5 Monitor and inspect plant	5.1 Plant to be monitored/inspected is physically identified
	5.2 Plant is monitored/inspected for normal operation or to detect deviations
	5.3 Correct action taken is in accordance with enterprise/site procedures
	5.4 Appropriate personnel are notified when defects are detected
6 Complete documentation	6.1 Documentation is updated and plant problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Evidence shall show that knowledge has been acquired of operating and monitoring gas production plants.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

REQUIRED SKILLS AND KNOWLEDGE

The extent of the Essential Knowledge and Associated Skills required follows:

KS01-PO319B Gas production plant

Evidence shall show that knowledge has been acquired for safe working practices of:

T1 Relevant Environmental, Occupational Health and Safety legislation and regulations

T2 Enterprise procedures

T3 Plant drawings and manufacturers manuals

T4 Introduction to and typical arrangements of power production plant

T5 Relevant plant and equipment, its location and operating parameters

T6 Electric motor types and characteristics

T7 Pump and compressor types and characteristics

T8 Valve, damper and actuator types and characteristics

T9 Switchgear types and characteristics

T10 Electrical protection types and characteristics

T11 Relevant state and territory regulations

T12 Plant status

T13 Enterprise recording procedures

T14 Supervisory, alarm, protection and control equipment

T15 Properties of gases, their uses and precautions to be takenT16 Properties of matter

T16 Lubrication and bearings

T17 Electrical principles

KS02-PO319B Gas production plant

Specific skills needed to achieve the Performance Criteria:

T1 Interpret plant drawings and manufacturers manuals

T2 Apply relevant state and territory regulations

T3 Apply enterprise recording procedures

T4 Identify plant status

T5 Prepare plant/equipment for operation

T6 Organise resources

T7 Operate gas production plant

T8 Apply diagnostic and testing techniques

T9 Identify and respond to abnormal plant operating conditions

REQUIRED SKILLS AND KNOWLEDGE

T10 Plan and prioritise work

T11 Use relevant hand tools

T12 Communicate effectively

T13 Apply data analysis techniques and tools.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the Range Statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all components parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitude competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence

need to be ‘rich’ in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its ‘richness’. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

**Critical aspects
of evidence
required to
demonstrate
competency in
this unit** **9.2)**

Before the critical aspects of evidence are considered all pre-requisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the “Assessment Guidelines – UEP12”. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and Range Statement
 - Apply sustainable energy principles and practices as specified in the Performance Criteria and Range Statement
 - Demonstrate an understanding of the essential knowledge and associated skills as described in 6) Essential Knowledge and Associated Skills of this unit
 - Demonstrate an appropriate level of employability skills
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated performance across a representative range of contexts from the prescribed items below:
 - Knowledge and application of relevant sections of:

Occupational Health and Safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures

- Preparation and planning of work
- Operation of gas production plant
- Operationally testing plant
- Analysing plant faults
- Monitoring plant operation
- Knowledge of the properties of gases, their uses and precautions to be taken
- Dealing with an unplanned event by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items

Context of and specific resources for assessment **9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions.

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and application of work.

In addition to the resources listed above in Context of assessment', evidence should show competency working, in limited spaces, with different types of plant and equipment as well as different structural/construction types and methods and in a variety of environments.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Section 1.3.00

Assessment Guidelines.

Note: Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units 9.5)

There are no recommended concurrent assessments with this unit, however in some cases efficiencies may be gained in terms of learning and assessment effort being concurrently managed with allied competency standard units where listed.

Nil

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

Systems, plant and/or equipment may include electrical supply switchboards; storage plant; heaters, electrical motors; valves, actuators and dampers (electric, hydraulic, pneumatic, manual); and supervisory, protection, alarm and control equipment.

Gas production plant may include carbon dioxide, ammonia, chlorine and hydrogen.

Safety standards may include relevant sections of Occupational Health and Safety legislation, enterprise safety rules, relevant state and federal legislation and national standards for plant.

Information and documentation sources may include verbal and written communications; enterprise/site safety rules documentation/form(s), enterprise/site standing and operating instructions, enterprise/site log book, manufacturer operation and maintenance manuals and dedicated computer equipment.

Technical and operational indicators may include stimuli (audio, smell, touch, visual), remote or local indicators and recorders, computers and alarms (visible and or audible).

RANGE STATEMENT

Communications may be by means of telephone, two way radio, pager, public address system, computer (electronic mail) and operating log (written or verbal).

Tests may include stand-by plant tests, post maintenance operating tests and alarm tests

Appropriate personnel to consult, give or receive direction may include supervisor/team leader or equivalent, power system control personnel or equivalent, technical and engineering officers or equivalent, contractor and specialist personnel, maintenance staff and power plant operations personnel.

Test, fault finding and operating tools may include hand and power tools and leak detection equipment.

Operating environment may be during inclement or otherwise harsh weather conditions, in wet/noisy/dusty/hot areas and during continuous operation.

Faults and abnormal operating conditions may include motor/pump/ actuator/valve/ dampers failure/malfunctions, control equipment failure/ malfunctions, loss of electrical supply to plant and equipment, loss/low air, water, lubricating oil to plant/equipment, gas system faults/malfunctions, gas leaks, high filter/strainer dp and excessive vibration pumps/motors.

Generic terms are used throughout this Training Package for vocational standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms are given in Section 2.1 Preliminary Information and Glossaries.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**
Operations.

UEPOPS340B Operate and monitor a steam turbine

Modification History

Release	Action	Core/Elective	Details	Points
2	Edit		Remove word 'of' in Unit Descriptor.	

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit deals with the skills and knowledge required to operate and monitor an in-service steam turbine.

Application of the Unit

Application of the Unit 2)

This unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit may require a licence to practise in the workplace in some States or Territories. There may also be additional assessment activities required by regulatory authorities for the issue of the licence to practise.

Practice in this unit is subject to regulations directly related to Occupational Health and Safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites

Prerequisite Unit(s) 4)

Competencies 4.1)

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

There are no pre-requisite units.

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following levels. A description of what each level entails is provided in Section 2.3.1 Language, Literacy and Numeracy.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills 5)

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the Performance Criteria describe the required performance

essential outcomes of a competency standard unit needed to demonstrate achievement of the element.
Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Plan and prepare work	1.1 Safety issues are identified to comply with enterprise/site requirements 1.2 Work requirements are identified from relevant personnel and documentation 1.3 Pre-operational checks are carried out on plant according to manufacturer recommendations and site requirements 1.4 Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
2 Operate plant	2.1 Turbine output is adjusted to meet demand whilst observing operating requirements and minimising turbine life expenditure 2.2 Plant is operated in accordance with enterprise and manufacturer operating procedures 2.3 Plant is monitored and observed to detect deviations from normal operating conditions 2.4 Corrective actions are taken to rectify abnormalities in accordance with manufacturer and enterprise/site procedures
3 Test plant operation	3.1 Tests are performed in accordance with defined procedures applicable to the operational test 3.2 System and plant is observed for correct operational response 3.3 Corrective action is taken when response is not in accordance with documentation, plant integrity or personnel safety requirements

ELEMENT	PERFORMANCE CRITERIA
	3.4 Plant is returned to required operational status upon completion of test
4 Analyse system faults	4.1 Causes of abnormal plant operating conditions are identified by analysing the technical and operational information in a logical and sequential manner
	4.2 Corrective action taken is in accordance with enterprise/site procedures
	4.3 Plant integrity and personnel safety is maintained through consultation with appropriate personnel, and reference to plant, technical and operational documentation
	4.4 Appropriate personnel are notified when defects are detected
5 Monitor plant	5.1 Plant to be monitored is identified
	5.2 Plant is monitored for normal operation or to detect deviations
	5.3 Appropriate personnel are notified when defects are detected
6 Complete documentation	6.1 Documentation is updated and plant problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Evidence shall show that knowledge has been acquired of operating and monitoring a steam turbine.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

The extent of the Essential Knowledge and Associated Skills required follows:

REQUIRED SKILLS AND KNOWLEDGE

KS01-PO340B A steam turbine

Evidence shall show that knowledge has been acquired for safe working practices of:

T1 Relevant environmental, occupational health and safety legislation and regulations

T2 Enterprise procedures

T3 Plant drawings and manufacturers manuals

T4 Introduction to and typical arrangements of power production plant

T5 Relevant plant and equipment, its location and operating parameters

T6 Electric motor types and characteristics

T7 Pump and compressor types and characteristics

T8 Valve, damper and actuator types and characteristics

T9 Switchgear types and characteristics

T10 Electrical protection types and characteristics

T11 Electrical fundamentals

T12 Relevant state and territory regulations

T13 Plant status

T14 Enterprise recording procedures

T15 Control and data acquisition systems

T16 Supervisory, alarm and protection equipment

T17 Turbine speed control equipment

T18 Heat transfer principles

T19 System components and interaction

T20 The system components and their interaction with other plant and equipment external to that covered by this competency

T21 Station water distribution systems

T22 Fire protection control systems

T23 Principles of condensate and feedwater chemical treatment

T24 Turbine life expenditure and control

T25 Turbine bypass system

T26 Vacuum raising and turbine gland sealing systems

T27 Thermodynamics

T28 Properties of matter

T29 Lubrication and bearings

REQUIRED SKILLS AND KNOWLEDGE

T30 Liquid pumping systems

T31 Turbine construction and operating principles

T32 Turbine lubrication and oil systems, types and characteristics

T33 Condensate and feedwater systems

T34 Circulating water system

T35 Condenser systems, types and characteristics

T36 Turbine efficiency principles

T37 Transformers, types and characteristics

KS02-PO340B A steam turbine

Specific skills needed to achieve the Performance Criteria:

T1 Interpret plant drawings and manufacturers manuals

T2 Apply relevant state and territory regulations

T3 Apply enterprise recording procedures

T4 Identify plant status

T5 Prepare plant/equipment for operation

T6 Organise resources

T7 Operate turbine plant and equipment

T8 Apply diagnostic and testing techniques

T9 Identify and respond to abnormal plant operating conditions

T10 Plan and prioritise work

T11 Use relevant hand tools

T12 Communicate effectively

T13 Apply data analysis techniques and tools.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the Range Statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all components parts of this unit and, performed in

EVIDENCE GUIDE

accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitude competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in

9.2)

this unit

Before the critical aspects of evidence are considered all pre-requisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the “Assessment Guidelines – UEP12”. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and Range Statement
 - Apply sustainable energy principles and practices as specified in the Performance Criteria and Range Statement
 - Demonstrate an understanding of the essential knowledge and associated skills as described in 6) Essential Knowledge and Associated Skills of this unit
 - Demonstrate an appropriate level of employability skills
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated performance across a representative range of contexts from the prescribed items below:
 - Knowledge and application of relevant sections of: Occupational Health and Safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures
 - Preparation and planning of work
 - Operation of turbine plant and equipment
 - Operationally testing plant
 - Analysing plant faults
 - Monitoring plant operation
 - Knowledge of the system components and their interaction
 - Knowledge of turbine operational processes
 - Knowledge of turbine supervision and control systems
 - Dealing with an unplanned event by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items

Context of and specific resources for assessment**9.3)**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions.

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and application of work.

In addition to the resources listed above in Context of assessment', evidence should show competency working, in limited spaces, with different types of plant and equipment as well as different structural/construction types and methods and in a variety of environments.

Method of assessment**9.4)**

This unit shall be assessed by methods given in Section 1.3.00 Assessment Guidelines.

Note: Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units**9.5)**

There are no recommended concurrent assessments with this unit, however in some cases efficiencies may be gained in terms of learning and assessment effort being concurrently managed with allied competency standard units where listed.

Nil

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

Plant and equipment may include turbine and auxiliary plant; turbine lubrication and power/control oil systems; turbine by-pass system plant; condensate and feedwater system plant to boiler economiser inlet NRV; condensate polishing plant; high and low pressure heating systems; steam condensing and cooling systems; condenser vacuum raising equipment; turbine gland sealing equipment; cooling water systems plant; boiler feedwater deaerating equipment; condensate and feedwater chemical treatment equipment; electricity distribution systems a.c. and d.c.; station water distribution systems; hydraulic oil system; pumps; compressed air systems; computers with equipment control functions; supervisory, alarm, protection and control equipment; and diesel engine driven auxiliary plant

Safety standards may include relevant sections of Occupational Health and Safety legislation, enterprise safety rules, Australian standards, national standards for plant and relevant state and federal legislation.

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; manufacturer operational and maintenance manuals; equipment and alarm manuals; enterprise log books; dedicated computer equipment; enterprise standing instructions; and plant notes.

Technical and operational indicators may include stimuli (audio, smell, touch, visual), remote or local indicators and recorders, computers and alarms (visible and or audible).

Communications may be by means of telephone, two way radio, pager, computer (electronic mail) and operating log (written or verbal).

Tests may include loss of a major auxiliary controls response checks, stand-by plant “cut-in” tests, valves operating checks, on-load turbine valve and emergency governor operation test, performance tests, boiler feed pumps “low load leak off” valve operation tests, heater leak checks, alarm and protection tests.

Appropriate personnel to consult, give or receive direction may include supervisor/team leader or equivalent; other coordinators of energy production or

RANGE STATEMENT

equivalent; technical and engineering officers or equivalent; maintenance staff; other operating staff and contractor staff.

Operating environment may be remote from plant and equipment being operated; where operation is assisted by remote indicators of plant status and other parameters monitored; in wet/noisy/dusty/hot areas; during night periods; and during inclement or otherwise harsh weather conditions.

Faults and abnormal operating conditions may include loss of a major auxiliary; loss of electrical Generation to auxiliaries; turbine water ingress; excessively high turbine and turbine valves heating/cooling rates/differentials; high condenser vacuum; condenser tube leak; high dissolved oxygen, conductivity; high turbine bearing temperatures/vibration; high/low bearing oil temperature; loss of turbine bearing oil flow/pressure; low/high pressure heaters malfunctions; actuator/valve mechanical/electrical faults/failure; failed field devices; and turbine protection.

Generic terms are used throughout this Training Package for vocational standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms are given in Section 2.1 Preliminary Information and Glossaries.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field	11)
	Operations.

TLID2010A Operate a forklift

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor

This unit involves the skills and knowledge required to operate a forklift, including checking forklift condition, driving the forklift to fulfil operational requirements, monitoring site conditions, and monitoring and maintaining forklift performance. Assessment of this unit will usually be undertaken within a licensing examination conducted by, or under the authority of, the relevant state/territory OH&S authority. Licensing, legislative, regulatory or certification requirements are applicable to this unit.

Application of the Unit

Application of the Unit

Operation of a forklift must be carried out in compliance with the licence requirements and regulations of the relevant state/territory authority.

Operation of a forklift is performed under some supervision, generally within a team environment. It involves the application of routine equipment operation principles and procedures to maintain the safety and operation of a forklift in a variety of operational contexts.

Licensing/Regulatory Information

Refer to Unit Descriptor

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 Check forklift condition	1.1 Condition of forklift is checked for compliance with OH&S and workplace requirements for warning devices, manufacturers specifications and the nature of the load shifting task 1.2 Attachments are checked to ensure appropriate adjustment and operation 1.3 Mirrors and seats are adjusted for safe operation by the driver 1.4 Log books are checked and appropriate workplace documentation is completed in accordance with workplace requirements
2 Drive the forklift	2.1 Forklift is started, steered, manoeuvred, positioned and stopped in accordance with regulations and manufacturers instructions 2.2 Engine power is managed to ensure efficiency and performance and to minimise engine and gear damage 2.3 Operational hazards are identified and/or anticipated and avoided or controlled through defensive driving and appropriate hazard control techniques 2.4 Forklift is driven in reverse, maintaining visibility and achieving accurate positioning 2.5 The forklift is parked, shut down and secured in accordance with manufacturers specifications, regulations and workplace procedures
3 Operate a forklift to handle loads	3.1 The lifting task to be undertaken is appropriately planned and the correct lifting truck and attachments are selected 3.2 The load is lifted, carried, lowered and set down in accordance with OH&S legislation, manufacturers specifications and company procedures

ELEMENT	PERFORMANCE CRITERIA
4 Monitor site conditions	4.1 When selecting the most efficient route, hazards and traffic flow are identified and appropriate adjustments are made 4.2 Site conditions are assessed to enable safe operations and to ensure no injury to people or damage to property, equipment, loads or facilities occurs
5 Monitor and maintain forklift performance	5.1 Performance and efficiency of vehicle operation is monitored during use 5.2 Defective/irregular performance and malfunctions reported to relevant personnel 5.3 Forklift records are maintained/updated in accordance with workplace procedures and legislative requirements

Required Skills and Knowledge

REQUIRED KNOWLEDGE AND SKILLS

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

Required knowledge:

- Relevant duty of care requirements pertaining to the operation of a forklift
- Relevant OH&S and environmental procedures and regulations
- Workplace operating procedures
- Forklift controls, instruments and indicators and their use
- Forklift handling procedures
- Procedures to be followed in the event of an operational emergency
- Engine power management and safe operating strategies
- Efficient driving techniques
- Operating hazards and related defensive driving and hazard control techniques
- Pre-operational checks carried out on forklift and related action
- Principles of stress management when driving a forklift
- Site layout and obstacles

Required skills:

- Communicate effectively with others when operating a forklift
- Read and interpret instructions, procedures, information and signs relevant to the operation of a forklift

Required skills:

- Interpret and follow operational instructions and prioritise work
- Complete documentation related to the operation of a forklift
- Operate electronic communication equipment to required protocol
- Work collaboratively with others when operating a forklift
- Adapt appropriately to cultural differences in the workplace, including modes of behaviour and interactions with others
- Promptly report and/or rectify any identified problems, faults or malfunctions in accordance with regulatory requirements and workplace procedures
- Implement contingency plans for unexpected events when operating a forklift
- Apply precautions and required action to minimise, control or eliminate hazards that may exist during the operation of a forklift
- Monitor work activities in terms of planned schedule
- Modify activities depending on differing operational contingencies, risk situations and environments
- Apply fatigue management knowledge and techniques
- Work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- Operate and adapt to differences in equipment in accordance with standard operating procedures
- Select and use required personal protective equipment conforming to industry and OH&S standards
- Identify points of balance and safe lifting positions on a range of loads when operating a forklift (including accessories)
- Monitor performance of forklift and its equipment and take appropriate action where required
- Ensure that a forklift and its equipment are maintained in terms of service schedule and standard operating procedures
- Check and replenish fluids and carry out lubrication processes in the course of work activities

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

- The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the

EVIDENCE GUIDE

demonstrate competency in this unit

requirements of the elements and performance criteria of this unit and include demonstration of applying:

- the underpinning knowledge and skills
- relevant legislation and workplace procedures
- other relevant aspects of the range statement

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.

Types of forklift may include:

- counterbalance trucks
- reach trucks
- pallet trucks

RANGE STATEMENT

Operations may be carried out in typical forklift operational situations, including:	• operations conducted at day or night • typical weather conditions • on the open road • on a private road or worksite • while at a workplace
Customers may be:	• internal or external
Workplaces may comprise:	• large, medium or small worksites
Work may be conducted in:	• restricted spaces • exposed conditions • controlled or open environments
Loads to be shifted may require:	• special precautions
Loads to be shifted may be:	• irregularly shaped • packaged or unpackaged • labelled or unlabelled • palletted or unpalletted
Hazards in the work area may include exposure to:	• chemicals • dangerous or hazardous substances • movements of equipment, goods and materials
Personnel in the work area may include:	• workplace personnel • site visitors • contractors • official representatives
Forklift handling procedures may include:	• starting a forklift • steering and manoeuvring a forklift • accelerating and braking • positioning and stopping a forklift • reversing a forklift • operating forklift controls, instruments and indicators • using defensive driving techniques • managing engine performance
Pre-operational checks may include:	• visual check of forklift • checking and topping up of fluid levels • checks of tyres • checks of operation of forklift lights and indicators • checks of brakes
Hazards may include (examples only):	• wet and iced operating surfaces • oil on operating surface

RANGE STATEMENT

	• faulty brakes • workplace obstacles and other operational equipment and vehicles • damaged loads and pallets • other personnel in work area
Depending on the type of organisation concerned and the local terminology used, workplace procedures may include:	• company procedures • enterprise procedures • organisational procedures • established procedures
Personal protection equipment may include:	• gloves • safety headwear and footwear • safety glasses • two-way radios • high visibility clothing
Information/documents may include:	• goods identification numbers and codes, including IMDG markings and HAZCHEM signs • manifests, bar codes, picking slips, merchandise transfers, stock requisitions, goods and container identification • Australian Standard 2359 - Industrial Truck Code • manufacturers specifications for forklift and associated equipment • operations and service record book or log • workplace procedures and policies for the operation of forklifts • supplier and/or client instructions • ADG Code and material safety data sheets • regulatory requirements concerning the use of forklifts • award, enterprise bargaining agreement, other industrial arrangements • standards and certification requirements • quality assurance procedures • emergency procedures
Applicable procedures and codes may include:	• relevant state/territory regulations pertaining to the operation of forklifts • relevant codes and standards, including Australian Standard 2359 - Industrial Truck Code • relevant state/territory OH&S legislation • relevant state/territory fatigue management regulations • relevant state/territory environmental protection legislation

Unit Sector(s)

Not Applicable

Competency Field

Competency Field	D - Load Handling

MSS404050A Undertake process capability improvements

Modification History

New unit, superseding MSACMT450A Undertake process capability improvements* - Equivalent

* New prerequisite *MSS404052A Apply statistics to operational processes* superseding MSACMT452A Apply statistics to processes in manufacturing

Unit Descriptor

This unit of competency covers the skills and knowledge required to make process capability improvements, including analysing data from the process, developing improvements to eliminate variation due to assignable causes, and then implementing actions.

Application of the Unit

This unit applies to a person who reviews a range of process capability data and information, makes/arranges for changes to be made to procedures, equipment or process and then recalculates the process capability and monitors resulting improvement actions. The person will typically be a technical expert, team leader or be in a role where they have sufficient technical understanding of processes in their own work and that of others to be able to suggest and justify process capability improvements.

Process capability may have been determined using either a six sigma or three sigma processes. This unit applies to the application of statistical methods and the determination of capability based on those methods. Other related units may be *MSS404052A Apply statistics to operational processes* and *MSS404053A Use six sigma techniques*

This unit primarily requires the application of skills associated with communication, information gathering and analysis. Initiative, enterprise and problem solving are also required to identify opportunities to improve process capacity. This unit also requires aspects of self-management and learning to validate own analysis.

For a qualitative approach to improvement (one not using statistics) see *MSS403051A Mistake proof an operational process*.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MSS404052A Apply statistics to operational processes

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	Obtain required data	1.1	Identify process for study
		1.2	Obtain/organise process to obtain required data/information
2	Analyse information	2.1	Analyse data and determine assignable causes
		2.2	Develop possible improvements to eliminate assignable causes
		2.3	Incorporate own experience and learning into proposed process improvement proposals
		2.4	Develop process improvement proposals
3	Improve process capability	3.1	Obtain required authorities to implement improvements
		3.2	Liaise with relevant people to implement improvements
		3.3	Obtain/organise required data for improved process

- 3.4 Recalculate process capability
- 3.5 Implement revised data collection/processing and new capability information
- 3.6 Monitor improvement actions and make adjustments, as necessary

Required Skills and Knowledge

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

Required skills

Required skills include:

- performing relevant mathematical operations
- identifying and using relevant statistical methods
- communicating and explaining data- related changes and procedures to individuals and groups
- negotiating with other employees and managers on proposed improvement actions
- analysing procedures and data to establish variation
- solving problems to root cause where assignable cause of variation is not obvious
- working in a team
- using computer software relevant to required analyses and process

Required knowledge

Required knowledge includes:

- data collection methods
- data processing techniques required
- variability and normal distribution
- three sigma or six sigma processes, as relevant
- random and non-random results (recognition of assignable causes)
- causes of different types of non-random results
- causes of random variation
- process understanding sufficient to translate the data into variations in the process and determine methods of controlling them

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • analyse process information • calculate process capability/trial limits • improve process capability (or organise for it to be improved) • analyse revised process information and recalculate process capability.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence In all cases it is expected that practical assessment will

	be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time

	• process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Process capability	Process capability is: • the measurable ability of a process to reliably produce within calculated limits (the limits depend on the variation of the process)
Variation	All processes have variation. The approach in this unit is to separate random variation (no assignable cause) from non-random variation (which has an assignable cause). By finding and eliminating assignable causes, total variation is reduced and process capability will be improved
Six sigma	Six sigma refers to: • a statistical tool for recording defects and determining capability. Six sigma limits equate to 3.4 defects per million opportunities for each product or service transaction. Six sigma is also used as a general term covering a competitive systems and practices approach. Six sigma training typically covers several units of competency in this Training Package
Three sigma	Three sigma refers to: • a traditional statistical process control. Three sigma limits equate to 3 defects per thousand opportunities for each product or service transaction
Required data	The calculation of three sigma or six sigma limits requires process data. The data required depends on the nature of the limits being calculated
Assignable cause	Any non-random variation is said to have an ‘assignable cause’. The methods of data analysis common to statistical capability analysis as well as other methods of

	root cause analysis should be used to determine the cause of this non-random variation
Improved process capability	Improvements to process capability result from eliminating the causes of non-random variation. The improvements made may be: • as a result of continuous improvement with the process capability being recalculated periodically • as a result of an improvement project with the process capability recalculated as part of that project
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations Procedures may be: • written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS404052A Apply statistics to operational processes

Modification History

New unit, superseding MSACMT452A Apply statistics to processes in manufacturing - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to apply statistical theory and principles to the analysis and control of processes and operations.

Application of the Unit

This unit applies to a person working in an organisation applying statistical process control on processes or operations. The statistical process control will usually be used to monitor the processes or operations and determine when action needs to be taken. The appropriate action will then be taken in accordance with standard procedures.

The unit includes applying knowledge of frequency distribution and variation to the data/chart to distinguish between random and non-random variation and assumes understanding of the process and/or equipment to help interpret those results.

This unit primarily requires the application of skills associated with gathering and analysing data and communicating statistical information to others. This unit also has a strong emphasis on problem solving, initiative and enterprise, planning and organising, and self-management to solve problems and manage processes.

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	Collect process data	1.1	Interpret sampling scheme
		1.2	Obtain measurements in accordance with standard procedures
		1.3	Handle data, as required
2	Interpret data	2.1	Plot data on appropriate control chart
		2.2	Distinguish between random and non-random patterns of results
		2.3	Identify results outside the control limits
		2.4	Recognise situations requiring action
		2.5	Take appropriate action in accordance with standard procedures
		2.6	Determine cost of non-conformance
3	Calculate control limits	3.1	Consult relevant stakeholders to determine appropriate limits
		3.2	Use relevant methods to calculate/revise control limits
		3.3	Plot limits on control chart
		3.4	Explain impact of limit to relevant stakeholders

Required Skills and Knowledge

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

Required skills

Required skills include:

- applying a range of sampling procedures
- analysing samples and data for variation, relevance, reliability and representativeness
- problem solving the causes of variation in a process
- communicating with other employees to obtain samples/data and to explain results and limits
- plotting or documenting results
- undertaking calculations, including:
 - basic arithmetic functions
 - mean, range, mean of means, standard deviation (using appropriate calculation aids)
- using statistics to support process and operations control

Required knowledge

Required knowledge includes:

- sampling techniques
- purpose of sampling and measurement
- random, systematic and stratified sampling
- purpose of replication of data for statistical control
- samples, populations, finite and infinite populations and the differences
- methods of calculating means, standard deviations and the like and their purpose in statistical control
- the meaning of broad/narrow frequency distributions/range/standard deviations and skewed distributions in process terms
- concept of limits, including:
 - 1 sigma warning limits
 - 2 sigma warning limits
 - 3 sigma control limits
 - 6 sigma limits
- types of control charts and their applications to different types of process/product and for different purposes
- process causes of variation and typical cause types of non-random variation
- non-process (e.g. measurement) causes of variation
- recognition of stable and unstable processes
- causes of stability/instability in the process

- calculation of control limits/process capability and the applications of different control limits
- the standard distribution curve and confidence limits

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • follow sampling procedures • apply basic statistical processes • analyse data to identify variations and non-conformances • plot or document results.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning

	• reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen)

	• breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Sampling scheme	Sampling scheme may include: • sampling for attributes or sampling for variables • batch, continuous or custom made products • number of items/samples • size of sample • timing of sampling • location of sampling points • type of sample • number/type of measurements to be done on each sample • sampling equipment • measurement/testing equipment/methods
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/ recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations Procedures may be: • written, verbal, computer-based or in some other

	format
Handle data	Handle data may include: • calculating means, ranges, mean of means and standard deviations (using appropriate calculation aids) • entering data into a software package • recording data either in writing or electronically • other required manipulations of the data
Control chart	Control charts may include: • run • tally • mean/range • attributes • other relevant charts
Random	Random variation is the term used in statistical control to refer to those variations for which no cause can be found
Non-random	Non-random (also called identifiable cause, assignable cause or special cause) are those variations for which a cause can be found and so the cause of the variation eliminated. Non-random variation may also be used to predict possible breaches of the control limits
Control limits	Control limits (also referred to as process capability) are those limits within which the process will operate if it is 'under control'
Cost of non-conformance	Cost of non-conformance includes: • reprocessing/rework • expediting • unplanned service • excess inventory • complaint handline • downtime • returns • scrap • labour costs • material costs • infrastructure costs/overhead • utility costs
Appropriate limits	Appropriate limits may include:

	• 1 sigma warning limits • 2 sigma warning limits • 3 sigma control limits • 6 sigma limits

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

FDFPH1001A Follow work procedures to maintain Good Manufacturing Practice

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge required to comply with relevant Good Manufacturing Practice (GMP) codes and workplace quality standards.

Application of the Unit

Application of the unit	This unit has application in a pharmaceutical manufacturing environment. Responsibility for applying GMP relates to the person's work area.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify requirements of GMP related to own work	1.1. Sources of information on GMP requirements are located 1.2. GMP requirements and responsibilities related to own work are identified
2. Observe personal hygiene and conduct to meet GMP requirements	2.1. Personal hygiene meets GMP requirements 2.2. Clothing is prepared, used, stored and disposed of according to GMP and workplace procedures 2.3. Personal movement around the workplace complies with area entry and exit procedures
3. Follow GMP requirements when carrying out work activities	3.1. GMP requirements are identified 3.2. Work area, materials, equipment and product are routinely monitored to ensure compliance with GMP requirements 3.3. Raw materials, product and packaging components are handled according to GMP and workplace procedures 3.4. Contamination is identified and appropriate control measures are followed relating to work responsibilities and according to GMP requirements 3.5. Processes, practices or conditions which are not consistent with GMP are identified and reported according to workplace reporting procedure 3.6. The workplace is maintained in a clean and tidy order to meet GMP housekeeping standards 3.7. Work is conducted in accordance with workplace environmental guidelines

ELEMENT	PERFORMANCE CRITERIA
4. Complete workplace documentation to support GMP	4.1. Documentation and recording requirements are identified 4.2. Information is recorded according to workplace reporting procedures to meet GMP requirements

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Ability to:

- locate and follow workplace information relating to GMP responsibilities
- maintain personal hygiene consistent with GMP
- follow workplace procedures when moving around the workplace and/or from one task to another to maintain GMP
- use, store and dispose of appropriate clothing/footwear as required by work tasks and consistent with GMP
- carry out relevant checks and inspections as required, such as visual checks and inspections on equipment and/or raw materials, product, packaging components and processing conditions relevant to own work
- identify and respond to out-of-specification or unacceptable conditions or performance, such as making adjustments within level of responsibility and/or reporting
- follow GMP when carrying out work functions
- identify and report situations that do or could compromise GMP
- handle and/or dispose of out-of-specification or contaminated materials, packaging components/consumables and product, waste and recyclable material according to GMP as required by work responsibilities
- maintain the work area in a clean and tidy state
- identify and report signs of pest infestation
- use oral communication skills/language competence to fulfil the job role as specified by the organisation, including questioning, active listening, asking for clarification and seeking advice from supervisor
- work cooperatively within a culturally diverse workforce

Required knowledge

Knowledge of:

REQUIRED SKILLS AND KNOWLEDGE

- the role of GMP in preventing contamination, its relationship to legislative responsibilities and potential implications of non-compliance
- the relationship between the Code of GMP and workplace procedures, systems and processes
- GMP personnel and their respective responsibilities
- personal role, responsibility and accountability for implementing GMP
- sources of advice on GMP requirements for own work
- personal clothing and footwear requirements for working in and/or moving between work areas
- personal clothing use, storage and disposal requirements
- common types and sources of contamination that occur in the work area
- control methods and procedures used in the work area to maintain GMP, including an understanding of the purpose of control, the consequence if not controlled and the method of control where relevant
- monitoring, inspection and checking procedures relating to process control requirements
- standards for materials, equipment and utensils used in the work area
- evidence of out-of-standard or unacceptable performance
- action required in the event of non-compliance
- storage and handling requirements for raw materials, packaging components and product relevant to work role
- housekeeping requirements and responsibilities relating to own work, where relevant this includes use and storage of housekeeping/cleaning equipment
- waste collection, recycling and handling procedures relevant to own work responsibilities
- responsibilities for reporting and recording quality 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 be carried out in a manner that recognises the cultural and literacy requirements of the assessee and is appropriate to the work performed. Competence in this unit must be achieved in accordance with food safety standards and regulations.

EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of ability to: • identify requirements of GMP • apply GMP procedures to own work • identify and report non-compliances • complete required documentation.
Context of and specific resources for assessment	Assessment must occur in a real or simulated workplace where the assessee has access to: • GMP information relating to the workplace • related work instructions and procedures • work tasks and responsibilities • appropriate protective clothing • reporting and monitoring systems.
Method of assessment	This unit should be assessed together with other units of competency relevant to the work role. An example could be: • FDFOP1009A Follow work procedures to maintain quality.
Guidance information for assessment	To ensure consistency in one's performance, competency should be demonstrated on more than one occasion over a period of time in order to cover a variety of circumstances, cases and responsibilities, and where possible, over a number of assessment activities.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Policies and procedures	Work is carried out according to company policies and procedures, regulatory and licensing requirements, legislative requirements and industrial awards and agreements

RANGE STATEMENT	
Legislative requirements	Legislative requirements are typically reflected in procedures and specifications. Legislation relevant to this industry includes: • relevant GMP codes • the Therapeutic Goods Act • the Food Standards Code, including labelling, weights and measures legislation • legislation covering environmental management, occupational health and safety (OHS), anti-discrimination and equal opportunity
Reporting systems	Reporting systems may include: • electronic and manual data recording and storage systems

Unit Sector(s)

Unit sector	Pharmaceutical manufacturing

Competency field

Competency field	

Co-requisite units

Co-requisite units		

RIIRIS201B Conduct local risk control

Modification History

Not applicable.

Unit Descriptor

This unit covers the conduct of local risk control in resources and infrastructure industries. It includes identifying hazards; assessing risk and identifying unacceptable risk; identifying, assessing and implementing risk treatments; and completing records and reports.

Application of the Unit

This unit is appropriate for those working in entry level operational roles, at worksites within:

- Civil construction
- Coal mining
- Drilling
- Extractive industries
- Metalliferous mining

Licensing/Regulatory Information

Refer to Unit Descriptor.

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

ELEMENT	PERFORMANCE CRITERIA
1. Identify hazards	1.1. Access, interpret and apply compliance documentation relevant to conducting local risk control 1.2. Inspect work area conditions to identify potential hazards in the workplace 1.3. Apply existing procedures to deal with recognised hazards 1.4. Recognise the type and scope of unresolved hazards and their likely impact
2. Assess risk and identify unacceptable risk	2.1. Assess and determine consequence if the event should occur 2.2. Consider and determine likelihood of the event 2.3. Identify criteria for the acceptability/unacceptability of the risk or source from the appropriate party 2.4. Assess risk against criteria to identify if it warrants ' unacceptable risk ' status and either action or refer to the appropriate party
3. Identify, assess and implement risk treatments	3.1. Identify and consider all possible risk treatment options 3.2. Identify options by preliminary analysis and consideration of possible options 3.3. Analyse options, including the identification of resource requirements 3.4. Select most appropriate action for dealing with the situation 3.5. Plan and prepare the course of action in detail and acquire/obtain required resources 3.6. Implement the risk treatment 3.7. Review risk management processes
4. Complete records and reports	4.1. Communicate information on the course of action and implementation 4.2. Complete records and reports for hazards and actions from personal risk assessment as specified by legislation and site

	requirements

Required Skills and Knowledge

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

Required skills

Specific skills are required to achieve the performance criteria in this unit, particularly for the application in the various circumstances in which this unit may be applied. This includes the ability to carry out the following as required to conduct local risk control:

- apply legislative, organisation and site requirements and procedures
- speak clearly and directly, listen carefully to instructions and information, respond to and clarify directions
- collect, analyse and organise information
- access, interpret and apply site information
- work with other team members
- apply teamwork to a range of situations
- apply problems solving skills
- apply decision making skills
- show initiative in adapting to changing work conditions or contexts
- apply time management
- take responsibility for self organisation of work priorities
- apply mathematical skills to perform a basic risk ranking of hazards
- interpret and apply material safety data sheets (MSDS)

Required knowledge

Specific knowledge is required to achieve the performance criteria of this unit, particularly its application in a variety of circumstances in which the unit may be used. This includes knowledge of the following as required to conduct local risk control:

- risk management processes and methods, including: identifying hazards, assessing risks, determining acceptability of risks, identifying controls
- AS/NZS 4360-2004 Risk Management
- specific worksite risk management procedures
- specific worksite safety systems information
- specific worksite communication, reporting and recording procedures

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	The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following: • knowledge of the requirements, procedures and instructions to conduct local risk control • implementation of requirements, procedures and techniques for the safe, effective and efficient conduct of local risk control • working with others to undertake and conduct of local risk control that meets all of the required outcomes • consistent timely completion of conducting local risk control that safely, effectively and efficiently meets the required outcomes
Context of and specific resources for assessment	• This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills. • The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job. • Customisation of assessment and delivery environment to sensitively accommodate cultural diversity. • Aboriginal people and other people from a non English speaking background may have second language issues.

	- Assessment of this competency requires typical resources normally used in the work environment. Selection and use of resources for particular worksites may differ due to site circumstances. - Where applicable, physical resources should include equipment modified for people with disabilities. - Access must be provided to appropriate learning and/or assessment support when required.
Method of assessment	This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods: - written and/or oral assessment of the candidate's required knowledge - observed, documented and/or first hand testimonial evidence of the candidate's: - implementation of appropriate requirement, procedures and techniques for the safe, effective and efficient achievement of required outcomes - consistently achieving the required outcomes - first hand testimonial evidence of the candidate's: - working with others to undertake and conduct of local risk control
Guidance information for assessment	Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.

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 compliance documentation may include:	• legislative, organisation and site requirements and procedures • Australian standards • code of practice • Employment and Workplace Relations legislation • Equal Employment Opportunity and Disability Discrimination legislation
Hazard is defined as:	• a source of potential harm or a situation with a potential to cause loss
Hazards may include:	• equipment • stored energy • methods • plans • people • the work environment
Risk is defined as:	• The chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood
Risk treatment is defined as:	• selection and implementation of appropriate options for dealing with risk
Consequence is defined as:	• the outcome of an event or situation expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain
Frequency is defined as:	• a measure of likelihood expressed as the number of occurrences of an event in a given time
Likelihood is used as:	• a qualitative description of probability and frequency
Probability is defined as:	• the measure of the chance of occurrence expressed as a number between 0 and 1
Criteria for the acceptability/unacceptability of the risk must be determined by:	• the organisation's internal policy, goals and/ or objectives in reference to relevant legislation
Risk treatment options may include:	• eliminating the hazard • substitution • engineering controls • administrative controls (procedures, etc) • personal protective equipment.
Records and reports may include:	• hazard reporting forms • supervisor/deputy/OCE reports

	• incident reports • near miss reports • shift reports • JSAs • Take 5 • Step Back

Unit Sector(s)

Risk Management

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.

MSS405010A Manage relationships with non-customer external organisations

Modification History

New unit, superseding MSACMS606A Manage relationships with non-customer external organisations - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to identify and manage relationships with non-customer external organisations, such as community groups, other businesses, training providers, research organisations and government departments.

Application of the Unit

This unit applies to a person who has policy responsibility in an organisation for managing external relationships that may impact on the performance, community standing or regulatory compliance of the organisation. Examples of the application of this unit include department leaders, managers or similar. The unit covers managing a range of external organisations to the maximum benefit of the organisation and the organisation's customers while also identifying areas of mutual interest and benefit with the external organisations. Relationships may or may not be initiated by the person's own organisation.

This unit does not cover the analysis and improvement of relationships between members of a value stream, such as suppliers and customers.

This unit primarily requires the application of skills associated with communication in gathering, analysing and applying information and consulting with stakeholders. Problem solving, initiative and enterprise, and planning and organising are also required. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into relationship systems and expectations.

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 mutual interest	1.1	Clarify the reason contact was/is to be made for each relevant external organisation
		1.2	Gather information on extent of past contact and any positive or negative outcomes for own and external organisation
		1.3	Identify expectations of initiating organisation
		1.4	Analyse the breadth, depth and complexity of external organisations' expectations
		1.5	Discuss expectations, ability to meet those expectations, and areas of mutual interest with relevant internal and external representatives
2	Determine contribution of relationship	2.1	Identify any value contributions from relationship
		2.2	Identify waste arising from relationship
		2.3	Classify waste as necessary or unnecessary
		2.4	Set key performance indicators (KPIs) for future relationship
3	Manage the	3.1	Measure current performance of relationship against

relationship	expectations and KPIs
3.2	Develop systems to enhance mutual benefit and value contributions from relationship
3.3	Develop systems to minimise and control necessary waste without causing harm
3.4	Eliminate unnecessary waste, where possible, without causing harm
3.5	Monitor KPIs and determine future strategy for the relationship
3.6	Continue to manage terminate the relationship in a manner which enhances the organisation

Required Skills and Knowledge

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

Required skills

Required skills include:

- using formal problem solving procedures, such as root cause analysis (RCA)
- analysing contributions to value from external relationships
- identifying waste (muda)
- developing formal and informal communication procedures with other individuals and organisations
- establishing sources of assistance in own organisation for external individuals and organisations
- interpreting documents, procedures and instructions for others
- establishing KPIs for relationships

Required knowledge

Required knowledge includes:

- strategic requirements of own organisation
- strategic benefits to the organisation from liaisons with external organisations
- possible external organisations which may offer benefits
- benefits which can be offered to the external organisations
- customer benefits/features from products and processes of own organisation

- waste (muda) elimination
- formal problem solving procedures (e.g. RCA)

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • analyse the value and waste in relationships • implement changes to relationships to improve outcomes for their organisation and its customers • monitor outcomes of a relationship against KPIs • communicate complex information to external representatives using a variety of methods and mediums.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace that is engaging with one or more non-customer external organisations. Access may be required to: • historical information on the relationship with external organisation and the involvement of the assessee • workplace procedures and plans • specifications and documentation relating to planned, currently being implemented, or implemented changes to relationships with non-customer external organisations • reports from supervisors/managers on interaction with external non-customer organisations • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation

	• case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and

	analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Reasons for contact	Reasons for contact may include: • research • innovation • mutual cooperation • strategic alliances • computer (or other) technology • emergency response
Waste	Waste (also known as muda in the Toyota Production System and its derivatives) is any activity which does not contribute to customer benefit/features in the product. Categories of waste include: • excess production and early production • delays • movement and transport • poor process design • inventory • inefficient performance of a process • making defective items • activities which do not yield any benefit to the organisation or any benefit to the organisation's customers

Necessary waste	Necessary waste includes: any activity or cost which does not contribute directly to customer benefit/feature in the product, and which cannot be avoided (e.g. regulatory compliance and fixed costs) Necessary waste cannot be eliminated but should be managed
Unnecessary waste	Unnecessary waste includes: any activity or cost which does not contribute directly to customer benefit/features in the product and can be avoided Unnecessary waste should be eliminated as quickly as practical

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405011A Manage people relationships

Modification History

New unit, superseding MSACMC611A Manage people relationships - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to manage the human relationship aspects of implementing and operating competitive systems and practices.

Application of the Unit

This unit applies to a person (who may be a manager, technical specialist or other person) who is required to work with employees and relevant people, encourage them to accept change and also to increase the quality, quantity and reliability of output consistent with customer requirements.

This unit primarily requires strong communication, teamwork and problem solving skills to achieve effective relationships that support a competitive systems and practices environment. Initiative, enterprise, planning and organising are also required to ensure relationships are monitored and issues are resolved proactively. The unit also includes aspects of self-management and learning to ensure improvement of own performance and communication skills.

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

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

unit of competency. 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	Confirm organisation competitive systems and practices status	1.1	Establish number and status of competitive systems and practices techniques being used within the organisation
		1.2	Identify key performance indicators (KPIs) for each technique
		1.3	Identify key sections and value stream members responsible for each KPI
		1.4	Identify key personnel for communications
2	Develop an open environment	2.1	Establish and maintain regular dialogue between all levels and all relevant sections of the organisation
		2.2	Encourage a flow of communications in both directions
		2.3	Develop and maintain a formal mechanism for the flow of issues, concerns and suggestions in both directions
		2.4	Develop and maintain regular and frequent communication with all key stakeholders
3	Identify significant issues	3.1	In liaison with relevant team members/stakeholders, identify current and potential issues
		3.2	Assist team members/stakeholders to formulate issues
		3.3	Identify and define boundary and non-negotiable issues for all team members/stakeholders
		3.4	Negotiate with relevant team members/stakeholders over actual and potential issues

4	Proactively resolve issues	4.1	Liaise with team members/stakeholders to develop agreed, and where possible, win-win solutions
		4.2	Negotiate acceptable solutions, as required, in accordance with company practices/procedures
		4.3	Obtain any required official authorisations
		4.4	Consult with relevant stakeholders to develop implementation plan
		4.5	Implement solution
5	Monitor ongoing situation	5.1	Determine relevant KPIs for plan
		5.2	Check that implementation is proceeding to plan
		5.3	Check for unforeseen consequences
		5.4	Take appropriate action to resolve any arising issues

Required Skills and Knowledge

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

Required skills

Required skills include:

- analysing the competitive operational techniques being implemented in the organisation and the stage of implementation, including identifying people, related needs and issues
- using formal problem solving procedures, such as root cause analysis (RCA)
- analysing work procedures
- developing formal and informal communication procedures with others in work area, team leaders and other employees relevant to competitive systems and practices changes
- establishing sources of assistance in the organisation for people experiencing difficulty with competitive systems and practices changes
- interpreting procedures and instructions relevant to own expertise for others
- establishing KPIs for own work

Required knowledge

Required knowledge includes:

- features and benefits of common competitive operational practices, including:
 - Just in Time (JIT) and kanban systems
 - preventative maintenance
 - 5S housekeeping
 - continuous improvement processes (kaizen)
 - waste (muda) elimination
 - formal problem solving procedures (e.g. RCA)
 - standardised work
- health, safety and environment (HSE) principles and requirements for organisation
- change implementation contacts and procedures for the organisation
- employee assistance mechanisms in the organisation
- current processes and principles of operation sufficient to enable communication with others on the impact of competitive operational changes
- sources of data on the process/plant and possible applications to information distribution
- methods of determining own skill needs and developing skills, if required

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

A person who demonstrates competency in this unit must be able to provide evidence of the ability to:

- identify the processes used and scope of products/ services supplied by the organisation and the deliverables expected by customers
- relate processes and products/services to the competitive systems and practices implementation process and the stage of implementation
- communicate and gain support for changes made as a result of the implementation of the competitive systems and practices implementation
- develop formal and informal channels of communication, including feedback mechanisms
- proactively resolve issues and problems raised by people with the competitive systems and practices implementation process.

Context of and specific resources

Assessment of performance must be undertaken in a

for assessment	workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Key personnel	Key personnel for communication include:

	formally identified managers, supervisors and workforce delegates as well as key opinion shapers (e.g. employees with specialist technical knowledge) on the issue being communicated
Formal mechanisms	Formal mechanisms for communication will vary according to the organisation but may include: - noticeboards - employee circulars - consultative committees - staff associations - union representatives - team leaders
Stakeholders	Stakeholders may include: - team members - personnel officers - industrial officers - union delegates - production management - human relations management - financial management - engineering/technical personnel

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405012A Manage workplace learning

Modification History

New unit, superseding MSACMC612A Manage workplace learning - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to manage the learning and skill development for employees within an organisation implementing competitive systems and practices.

Application of the Unit

This unit applies to a person responsible for management of the identification of skills needed by employees to undertake required work in implementing competitive systems and practices, including arranging for any required learning processes. The unit does not cover trainer and assessor skills.

This unit primarily requires the application of skills associated with communication, teamwork, problem solving, initiative and enterprise in order to assess and address skill needs in an individual and in the organisation. Planning and organising is required to ensure skill development meets the needs of the organisation and aspects of self-management and learning are required to ensure improvement of performance.

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

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

unit of competency. 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	Determine current skill requirements for employees	1.1	Establish range and stage of implementation of competitive systems and practices techniques in the organisation
		1.2	Consult with relevant stakeholders on skill requirements for effective implementation of competitive systems and practices techniques used in the organisation
		1.3	Ensure records/database of skill mix currently required by employees are maintained in accordance with procedures
		1.4	Re-assess and monitor the skills required by employees as organisation requirements change
		1.5	Consult with relevant stakeholders to predict any new/different skill requirements arising from changes to products, processes, equipment or work organisation
2	Determine current skill mix of employees	2.1	Ensure current records/database of skill profile of individuals are maintained
		2.2	Consult with relevant stakeholders and monitor the application of these skills in the workplace to ensure they remain current and valid
		2.3	Review the actual skill mix of employees compared to the required skill mix
3	Make arrangements for skill development	3.1	Consult with employees and identify any mismatch of skills possessed and used and skills required
		3.2	Identify any new skills required due to anticipated changes

		3.3	Consult with relevant stakeholders to determine the best way to refresh existing skills/develop new skills
		3.4	Develop individual skill development program
		3.5	Ensure skill development arrangements are implemented in accordance with procedures
4	Forecast possible future skill needs	4.1	Examine strategic directions of organisation
		4.2	Discuss possible future directions with relevant stakeholders
		4.3	Determine possible long-term future skill requirements in consultation with relevant stakeholders
		4.4	Develop plan to ensure skills are developed in advance of when they are required

Required Skills and Knowledge

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

Required skills

Required skills include:

- analysing the competitive operational techniques being implemented in the organisation and the stage of implementation, including establishing skill needs to support implementation
- using formal problem solving procedures, such as root cause analysis (RCA)
- analysing work procedures
- developing formal and informal communication procedures with others in work area, team leaders and other employees relevant to competitive systems and practices changes
- establishing sources of assistance in the organisation for people experiencing difficulty with competitive systems and practices changes
- interpreting procedures and instructions relevant to own expertise for others
- establishing key performance indicators (KPIs) for own work

Required knowledge

Required knowledge includes:

- features and benefits of common competitive operational practices, including:
 - Just in Time (JIT) and kanban systems
 - preventative maintenance
 - 5S housekeeping
 - continuous improvement processes (kaizen)
 - waste (muda) elimination
 - formal problem solving procedures (e.g. RCA)
 - standardised work
- skill analysis methods or how to access skill analysis from relevant experts
- skill development methods or how to access skill development programs from relevant experts
- electronic and other systems to record and maintain training and skills records
- formal qualifications and skill standards relevant to competitive systems and practices and the processes and products of the organisation
- current processes and principles of operation sufficient to enable communication with others on the impact of competitive operational changes
- sources of data on the processes and/or products of the organisation and implications for workplace learning
- methods of determining own skill needs and developing skills, if required

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • identify the processes used and scope of products/ services supplied by the organisation and the deliverables expected by customers • relate processes and products/services to the competitive systems and practices implementation process and the stage of implementation • establish skill needs from processes/products and competitive implementation process in the organisation • use formal and informal channels of communication, including feedback mechanisms to assist in identification of skill needs • manage delivery and recording of training to ensure

	required skills are gained by employees.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to past and current skill development for employees • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Stakeholders	Stakeholders may include:

	• team members • personnel officers • industrial officers • union delegates • production management • human relations management • financial management • engineering/technical personnel
Skill development arrangements	Skill development arrangements include: • formal vocational and education delivery by a registered training provider (RTO) • education and training delivery by a higher education provider • non-accredited on and off the job training by the organisation, equipment suppliers, industry associations, and so on • coaching and mentoring • self-directed learning • arrangements for recording skills gained by employees
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the processes in an organisation • good operating practice as may be defined by industry codes of practice (e.g. Good manufacturing practice (GMP) and responsible care) • government regulations • industrial relations requirements and any classification changes that result from the acquisition of higher level skills Procedures may be: • written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405030A Optimise cost of a product or service

Modification History

New unit, superseding MSACMT630A Optimise cost of product* - Not equivalent

* Prerequisite *MSACMT631A Undertake value analysis of product costs in terms of customer requirements* - removed

Unit Descriptor

This unit of competency covers the skills and knowledge required to examine the costs of a product or service and determine methods of reducing costs.

Application of the Unit

This unit applies to an individual who is required to undertake a detailed study of a product or service's costs, including analysing it by its cost components to determine the best method of lowering the cost overall. This unit differs from *MSS405031A Undertake value analysis of a product or process costs in terms of customer requirements*, in that it looks at all costs, including overheads and takes a wider and more traditional approach to the cost of the product. Information and cost reduction strategies gained from the application of this unit may support other cost approaches in the enterprise, including value stream costing.

This unit primarily requires the application of skills associated with communication in gathering, analysing and applying information. Problem solving, initiative and enterprise, and planning and organising are required to calculate cost components and determine cost optimisation strategies. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into costing methods.

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	Analyse total cost components of a product or service	1.1	Identify all cost components of product or service
		1.2	Allocate cost components to major categories, such as overhead, depreciation, energy, consumables and labour
		1.3	Distinguish between costs which directly deliver customer features/benefits and waste
2	Optimise costs	2.1	Analyse causes of costs which lead to customer features/benefit
		2.2	Determine methods of increasing the customer benefit/cost ratio
		2.3	Analyse causes of waste costs
		2.4	Determine methods of reducing/eliminating waste costs
		2.5	Analyse interactions between cost components
		2.6	Check that one method of reducing costs does not cause an increase in another cost/reduction in consumer benefit
		2.7	Check that cost reduction plans do not reduce required levels of regulatory compliance or occupational health and safety (OHS)
3	Implement cost optimisation	3.1	Develop cost optimisation plans
		3.2	Negotiate with relevant people to agree on implementation plans

- 3.3 Take actions to implement the cost optimisation
- 3.4 Monitor the implementation of the cost optimisation
- 3.5 Make adjustments to the plan, as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- undertaking self-directed problem solving and decision-making on issues of a broad and/or highly specialised nature and in a wide variety of contexts
- communicating at all levels in the organisation and value chain and to audiences of different levels of literacy and numeracy
- identifying relevant cost component categories for organisation, product and process
- identifying customers, including final customer and features/benefits as valued by customers
- expressing customer features/benefits in cost terms
- determining application scope of cost reduction plan, including product/s, areas, employees and suppliers included in plan

Required knowledge

Required knowledge includes:

- cost components of product
- major costs which are controllable (and how to control them)
- concept and types of waste (muda)
- interrelationship of cost components and costs and benefits, including:
 - methods of estimating costs/benefits
 - acceptable benefit/cost ratios

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	A person who demonstrates competency in this unit must be able to provide evidence of their ability to: • determine relevant cost categories for a product or service • determine which costs are waste • develop a cost optimisation plan • implement and monitor the plan .
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads, hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace project(s) • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and

	disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree

	Competitive systems and practices should be interpreted so as to take into account: - the stage of implementation of competitive systems and practices - the size of the enterprise - the work organisation, culture, regulatory environment and the industry sector
Waste	Waste (also known as muda in the Toyota Production System and its derivatives) is any activity which does not contribute to customer benefit/features in the product. Within operations, categories of waste include: - excess production and early production - delays - movement and transport - poor process design - inventory - inefficient performance of a process - making defective items - activities which do not yield any benefit to the organisation or any benefit to the organisations customers
Cost	Cost includes: - the monetary value of expenditures able to be directly identified for supplies, services, direct labour, materials, components, cost of inventory, faults and reworks, rejects/scrap, equipment and other items used in the production of the product - allocations and estimates for indirect costs (e.g. indirect labour, rent, energy, water and cost of capital) where a direct monetary value cannot be identified
Cost optimisation plans	Cost optimisation plans should include: - application scope (e.g. product/s, services, areas, employees and suppliers included in plan) - target costs and target cost reductions - implementation period - method of monitoring - method of communicating progress to stakeholders

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405040A Manage 5S system in an organisation

Modification History

New unit, superseding MSACMT640A Manage 5S system in a manufacturing environment - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required for the overall management of the 5S system in an organisation.

Application of the Unit

This unit applies to an individual who is responsible for ensuring the smooth operation and continuous improvement of the 5S system in an organisation. This may be for an initial introduction of, or for the ongoing implementation and continuous improvement resulting from, 5S.

This unit requires the application of skills associated with problem solving, planning, communication and teamwork.

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	Organise an appropriate environment for 5S	1.1	Ensure managers and other key stakeholders support and understand 5S
		1.2	Arrange for team leaders to develop/maintain skills required for 5S
		1.3	Ensure team leaders are developing/maintaining skills required in their team members
		1.4	Ensure procedures and work practices reflect 5S needs and regulatory requirements
		1.5	Practise 5S in own work
		1.6	Eliminate roadblocks to 5S
2	Audit 5S implementation	2.1	Undertake spot checks of compliance
		2.2	Review workplace and records for indicators of compliance/non-compliance
		2.3	Encourage all levels of the workforce to routinely suggest areas for improvement
		2.4	Discuss 5S routinely with team leaders to seek ideas for implementation of improvement suggestions and encourage identification of non-conformance
3	Improve 5S	3.1	Negotiate solutions to non-conformances
		3.2	Implement agreed solutions
		3.3	Work with team leaders to develop opportunities for improvements
		3.4	Provide necessary resources for improvements
		3.5	Ensure procedures and practices change to reflect

improvements

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with stakeholders on aims and objectives of 5S program in the organisation
- mentoring and monitoring team leaders in their skills and knowledge of 5S and the organisations objectives for 5S
- conducting formal and informal meetings and explaining 5S and related concepts
- reviewing regulatory requirements for implications for 5S implementation
- facilitating team goals, activities and communications and accessing resources
- problem solving 5S poor performance and problems to root cause
- identifying requirements and negotiating resources for 5S implementation across the organisation
- planning and prioritising activities of teams
- identifying problems in 5S implementation caused by gaps in skills and/or knowledge and developing options to address them

Required knowledge

Required knowledge includes:

- organisation operations and structure
- principles of efficient workplace organisation
- purposes and methodology of 5S
- operation procedures relevant to jobs in the organisation
- relevant regulatory requirements
- processes for identification of skill gaps
- methods of addressing skill gaps
- ways of encouraging team leaders and operators to find and suggest areas for improvement
- methods of making/recommending improvements
- methods of accessing required resources
- non-conformance, what they are, assessment of severity and action to be taken

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • encourage and monitor a systematic approach to implementing 5S • analyse areas and records for evidence of 5S conformance/non-conformances • manage non-conformances in implementation of 5S • lead and motivate others in achieving 5S outcomes and making improvements to the 5S systems.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads, hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence.

	In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE)

	• takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations Procedures may be: • written, verbal, computer-based or in some other format
Roadblocks	Roadblocks include: • all factors which are inhibiting the smooth implementation of 5S
5S	5S is a system of work organisation originally developed in Japan based around housekeeping principles. A close translation of the five stages in the housekeeping approach is: • sort • set in order • shine • standardise • sustain
Sort	Sort involves keeping only what is absolutely necessary

	for the processes in the work area. Sort includes: - clearing the work area of all non-essential equipment and materials Non-essential items include: - those not required to either produce product, conduct process or operations or make required adjustments to equipment during process or operations
Set in order	Set in order includes: assigning required equipment and materials appropriate locations in the work area (locations should be clearly marked and labelled to show the item and proper location)
Shine	Shine includes: keeping the work area clean at all times. This should be carried out to a regular daily schedule against allowed time and, on most occasions, at the end of a job
Standardise	Standardising includes: - activities that help maintain the order and the housekeeping standards - using procedures and checklists developed from a procedure
Sustain	Sustain includes: - making sure that daily activities are completed every day regardless of circumstance - undertaking inspections, including: - informal inspections carried out often, at least weekly - formal inspections carried out at least monthly Specific actions should be followed up to generate continuous improvement
Items in work area	Items in work area may include: - tools - jigs/fixtures - materials/components - plant and equipment - manuals - personal items (e.g., lunch boxes and posters) - safety equipment and personal protective equipment

	• other items which happens to be in the work area

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405041A Implement improvement systems in an organisation

Modification History

New unit, superseding MSACMT641A Implement a continuous improvement system - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to introduce and institutionalise continuous improvement and breakthrough improvement processes in an organisation.

Application of the Unit

This unit applies to an individual responsible for the introduction of improvement systems across an organisation. The systems will include a continuous improvement system sometimes also known as kaizen, and breakthrough improvement sometimes known as kaizen blitz.

The continuous improvement (kaizen) system consists of strategies for continuously monitoring for and implementation of incremental improvements to processes, operations and products. Breakthrough improvement 'events' (kaizen blitz) covers the identification of improvement opportunities that are best undertaken in a single exercise.

This unit primarily requires the application of skills associated with teamwork, problem solving, initiative and enterprise, and planning and organising skills in order to identify, implement and institutionalise kaizen activity. Communication skills are required to gather information and consult with team members and other stakeholders. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into continual improvement.

Depending on the starting point for the continuous improvement program in the enterprise other relevant units may need to be selected, including:

- *MSS402080A Undertake root cause analysis*
- *MSS405011A Manage people relationships*
- *MSS405040A Manage 5S system in an organisation*
- *MSAPMSUP390A Use structured problem solving tools.*
-

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	Prepare for improvement systems implementation	1.1	Determine scope of improvement systems
		1.2	Identify key performance indicators (KPIs) for inclusion in improvement systems
		1.3	Prepare operating instructions and other required documentation for continuous and breakthrough improvement systems
		1.4	Ensure compliance with health, safety and environment (HSE) and other regulatory requirements are addressed in improvement instructions
		1.5	Identify and brief implementation team
		1.6	Prioritise areas operation, or processes requiring early action
		1.7	Prepare communication strategy for employees and other stakeholders
		1.8	Make infrastructure and support arrangements for improvement systems

		1.9	Obtain required approvals for commencement of improvement systems
2	Implement improvement systems	2.1	Arrange for initial training in continuous improvement (kaizen) and related competitive systems and practices for employees
		2.2	Facilitate the development of operating protocols for continuous improvement at the team level
		2.3	Establish decision making mechanism for system level continuous improvement
		2.4	Invite suggestions for breakthrough improvements
		2.5	Establish mechanism for prioritising breakthrough improvements
		2.6	Establish breakthrough teams and implement priority breakthrough events
		2.7	Clarify points of disagreement/uncertainty over improvement systems implementation through consultation and, where required, by reference to procedures or other relevant authority
3	Monitor implementation of improvement systems	3.1	Consult stakeholders on processes and perceived success of early implementation of continuous and breakthrough improvement events
		3.2	Analyse processes and operations to quantify variations in KPIs over early period of implementation of improvement systems
		3.3	Identify and solve ongoing performance issues
		3.4	Negotiate any differences between problems and proposed solutions
		3.5	Develop plans and obtain agreements to implement further improvements
		3.6	Implement improvements
		3.7	Measure changes and calculate benefits

		3.8	Complete all relevant documentation
		3.9	Communicate achievements to stakeholders
4	Institutionalise continuous improvement	4.1	Arrange for regular reviews of improvement systems
		4.2	Integrate improvement system reports with other reporting processes, including visual management systems
		4.3	Arrange for regular reporting of improvement system results to customers and other critical stakeholders

Required Skills and Knowledge

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

Required skills

Required skills include:

- implementing continuous and breakthrough improvement in a variety of contexts, including a mixture of supportive and non-supportive team environments
- undertaking self-directed problem solving and decision-making
- communicating across all levels in the organisation and to people of different levels of literacy
- analysing customer features/benefits, organisation goals and past performance and setting KPIs for inclusion in a continuous improvement system
- prioritising improvement suggestions in terms of:
 - the extent to which they add to customer features/benefits
 - feasibility
 - cost
- preparing operating procedures and other documentation, including establishing version control and amendment procedures
- analysing information and data to identify variation and evaluate improvements
- measuring and calculating performance variables
- solving problems to root cause
- identifying waste (muda)

Required knowledge

Required knowledge includes:

- continuous and breakthrough improvement (kaizen and kaizen blitz) philosophy and process
- competitive systems and practices, including:
 - value stream mapping
 - 5S
 - Just in Time (JIT)
 - mistake proofing
 - process mapping
 - establishing customer pull
 - setting of key performance indicators/metrics
- types of KPIs and their impacts on performance
- improvement processes, including implementation, monitoring and evaluation strategies

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • interpret operations, processes and products in terms of customer features/benefits and then set appropriate KPIs • prepare appropriate documentation for continuous and breakthrough improvement processes • establish decision making processes for considering system level continuous improvement suggestions • encourage and lead others in implementing continuous improvement system • problem solve implementation issues with continuous improvement system • lead and motivate others in planning, implementing and sustaining improvements.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area

	• specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Scope of improvement systems	The scope of the improvement systems includes: • target divisions, operations, work processes, products and sites that stakeholders want included in a particular improvement system • goals and objectives of the organisation: • levels of targeting for the continuous improvement system, including the system level

	focusing on the value stream and the overall achievement of customer defined features/benefits • process level focusing on individual processes, teams and team leaders
Relevance of KPIs	Relevance of KPIs includes: • appropriateness (did they lead to/encourage desirable performance?) • currency (are they still encouraging desirable performance?) • unintended consequences (do they lead to outcomes which are not desirable – even if some performance is desirable?) • signal/noise (is the balance between desirable and undesirable outcomes strong and positive?)
Instructions for incremental or breakthrough improvement processes	Instructions for incremental or breakthrough improvement process include: • methods for employees to suggest incremental or breakthrough improvement • criteria for identifying a breakthrough improvement need • approval processes • monitoring and reporting processes
Procedures	Procedures may include: • work instructions • standard operating procedures • formulas/ recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant, process or operation • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations • required procedures under legislation or regulation, awards and enterprise agreements Procedures may be: • written, verbal, computer based or in some other format
Waste	Waste (also known as muda in the Toyota Production System and its derivatives) is any activity which does not

	contribute to customer benefit/features in the product or process. Categories of waste include: • excess production and early production • delays • movement and transport • poor process design • inventory • inefficient performance of a process • making defective items • activities which do not yield any benefit to the organisation or any benefit to the organisations customers
Solve performance issues	Solving performance issues includes: • generating improvement ideas (brainstorming/asking experts) • selecting most appropriate improvement ideas to proceed with • conducting experiments where required to test idea • making final selection of improvement ideas • determining most appropriate improvement strategy (i.e. incremental or breakthrough (kaizen blitz) improvement)

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405050A Determine and improve process capability

Modification History

New unit, superseding MSACMT650A Determine and improve process capability* - Equivalent

* New prerequisite *MSS404052A Apply statistics to operational processes* superseding MSACMT452A Apply statistics to processes in manufacturing

Unit Descriptor

This unit of competency covers the skills and knowledge required to determine the actual (as distinct from design) capability of a process and then to analyse that process to remove assignable causes and reduce random causes. This would typically be done by a manager or technical expert support person either working in a team, or in close liaison with key stakeholders. Process capability is typically calculated using standard deviations.

Application of the Unit

This unit applies to an individual (who may be a production manager, plant/process engineer, technical specialist or similar) who is responsible for developing plans to stabilise and then improve process capability and following agreement the implementation of the plans to improve process capability. The organisation may use either a six sigma or three sigma process.

This unit primarily requires the application of skills associated with communication in gathering and analysing data and consulting with relevant personnel. Teamwork, problem solving, initiative and enterprise, and planning and organising are required to determine causes to variations and implement solutions. This is done in an environment using computer technology and also requires aspects of self-management and learning to ensure feedback and new learning is integrated into process improvements and operations management control systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MSS404052A Apply statistics to operational processes

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	Obtain data for process capability study	1.1	Identify the process requiring capability analysis including relevant procedures
		1.2	Identify customer specifications for product or service
		1.3	Obtain process capability data
2	Analyse data	2.1	Identify assignable causes of variation in liaison with relevant personnel
		2.2	Develop solutions to eliminate variation due to assignable causes in liaison with relevant personnel
		2.3	Analyse random variations for possible causes in liaison with relevant personnel
		2.4	Confirm causes of random variation
		2.5	Develop solutions to reduce random variations in liaison with relevant personnel
3	Take action to improve process	3.1	Develop plans to implement solutions
		3.2	Liaise with relevant personnel to implement solutions

capability	3.3	Gain necessary approvals, as required
	3.4	Monitor implementation and make adjustments, as required
	3.5	Determine new/revised process capability
	3.6	Implement revised process capability regime

Required Skills and Knowledge

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

Required skills

Required skills include:

- using a variety of statistical methods and calculations
- communicating and negotiating at all levels in the organisation and value stream and with individuals of different levels of literacy and numeracy
- negotiating with employees, suppliers and customers, where necessary, to achieve access to, or collection of, data
- planning process and data collection changes required for process improvement, including:
 - objectives
 - performance indicators to be monitored to indicate success of change
 - resources required
 - training required
 - communication and liaison required with employees, suppliers and customers
 - implementation period required
- analysing variations and categorising into assignable and random cause
- undertaking self-directed problem solving and decision-making on issues of a broad and/or highly specialised nature and in a wide variety of contexts
- working in and leading teams for data collection and process improvement
- using software computers and terminals, as required, to collect and analyse data

Required knowledge

Required knowledge includes:

- data collection methods
- data processing techniques required to establish variability and normal distribution
- calculate three sigma or six sigma processes, as relevant

- random and non-random results and processes for recognition of assignable causes
- causes of different types of non-random results
- causes of random variation
- process understanding sufficient to translate the data into variations in the process and determine methods of controlling them

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	A person who demonstrates competency in this unit must be able to provide evidence of their ability to: • collect or obtain data relevant process capability data from a variety of sources data • work with people and analyse data to determine assignable causes • plan and prepare improvement proposals • monitor implementation of improvement proposals.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects

	• suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems

	• supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Six sigma	Six sigma refers to: • a statistical tool for recording defects and determining capability which equates to only 3.4 defects per million opportunities for each product or service transaction Six sigma is also used as a general term covering a competitive systems and practices approach. Six sigma training typically covers several units of competency in this Training Package
Three sigma	Three sigma refers to: • a traditional statistical process control uses three sigma limits which equates to 3 defects per thousand opportunities for each product or service transaction
Process capability data	Process capability data includes: • customer requirements for product or service • process stability (control chart) performance • other charts and data
Procedures	Procedures may include: • work instructions • standard operating procedures

	• formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations Procedures may be: • written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405060A Develop the application of enterprise control systems in an organisation

Modification History

New unit, superseding MSACMT660A Develop the application of enterprise systems in manufacturing - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to continuously modify and improve or develop new enterprise-wide information technology (IT) based control systems, such as Supervisory Control and Data Acquisition (SCADA), Enterprise Resource Planning (ERP), Materials Resource Planning (MRPII) and similar. Typically the development of such a system will be in liaison with an appropriate technical expert who may be an internal expert or an external consultant.

Application of the Unit

This unit applies to an individual responsible for the development and implementation of new systems or modifications/changes to the current system. While the individual might generate the ideas for change themselves and also undertake a significant part of the final implementation, they may also be working closely with an appropriate technical expert (such as the software system supplier) who may actually make the modifications.

This unit primarily requires the application of skills associated with communication in gathering, analysing and applying information and consulting with stakeholders. Teamwork, problem solving, initiative and enterprise, and planning and organising skills are required to determine and implement effective enterprise systems and modifications. This unit also requires computer skills and aspects of self-management and learning to ensure feedback and new learning is integrated into system planning.

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	Monitor information and control needs of organisation	1.1	Check the use of current information
		1.2	Check the operation of current control systems
		1.3	Communicate regularly with key information users regarding any new or changed information control needs, including information needs from and to value stream
		1.4	Identify short comings in information and control provision
		1.5	Take appropriate action on information and control needs to meet organisational needs
2	Check the current system against organisation needs	2.1	Check the routine use of the system
		2.2	Check any system alarm or non-conformance notification and control operation
		2.3	Communicate regularly with key stakeholders about current system use and application
		2.4	Determine effect of non-conformance on enterprise system

		2.5	Identify problems/issues
		2.6	Take appropriate action on problems and issues
3	Determine developments needed in a new or significantly modified system	3.1	Identify needs requiring a new system or development of modifications to the current system
		3.2	Draft scope, specifications and outcomes required
		3.3	Liaise with key stakeholders and relevant technical experts to refine scope, specifications and outcomes needed in new or modified system
		3.4	Agree final scope, specifications and outcomes
4	Develop system	4.1	Develop project plan
		4.2	Ensure ongoing consultation with all relevant stakeholders
		4.3	Manage development project
		4.4	Manage trialling of modified system
		4.5	Ensure modified system meets organisational requirements
5	Implement modified system	5.1	Liaise with all affected personnel
		5.2	Develop and agree an implementation strategy
		5.3	Ensure all personnel have required skills
		5.4	Implement modified system
		5.5	Monitor implementation and modify, as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- identifying organisation needs from enterprise control system, including:
 - critical features (e.g. occupational health and safety (OHS), regulatory compliance and emergency shutdown)
 - essential features and operation controls
 - access levels and access security
 - cost of installation and operation
 - interfaces (e.g. human-machine, machine-machine, and system-system, e.g. SCADA with financial control systems)
- correctly accessing and inputting information
- communicating with stakeholders on information and control requirements
- matching monitoring, control and reporting capability of system to organisation requirements
- analysing features of enterprise system and determining training needs
- solving problems to root cause
- monitoring trials and initial implementation of enterprise control system

Required knowledge

Required knowledge includes:

- capability of resource planning/SCADA systems, as appropriate
- information and control needs of organisation/process
- project management
- support/training/skill development mechanisms available for access by personnel

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	A person who demonstrates competency in this unit must be able to provide evidence of their ability to: • analyse organisation needs and match to enterprise control system features • determine critical features required in enterprise control system • modify system as a result of trials or changing needs.

Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as SCADA software, ERP systems, MRP and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
SCADA	SCADA refers to: • a number of systems which automatically collect critical process data, perform required mathematical

	manipulations on it and then make control decisions and/or give required information personnel for action In the continuous operations sector, the SCADA system is sometimes integrated into other sophisticated computer control systems, such as distributed control system (DCS) and indeed these systems do merge in advanced systems. These organisations may simply refer to their SCADA as the DCS or other similar term (such as the proprietary name of the computer system)
Resource planning	Planning software is a general term applied to a number of software systems which integrate a range of business information, such as: • finance • logistics maintenance and production It is frequently referred to by names, such as ERP and MRP/MRP II
Value stream	The value stream begins with the customer and includes all actions (both value adding and non value added) by both internal sections/departments and external organisations to meet a customer requirement. Depending on the operations and the customer requirement stages where value stream actions may occur include: • sales outlet/representative • information gathering, data analysis and research • product design • raw material sourcing • intermediate processing • final assembler/collation/preparation • support services (e.g. accounting, finance and legal) • storage and delivery to customer • after market support

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405061A Determine and establish information collection requirements and processes

Modification History

New unit, superseding MSACMT661A Determine and establish information collection requirements and processes - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to determine what information is needed to support decision-making in a competitive systems and practices environment and then to set about establishing required information collection systems. This would usually be done as part of a team and would require consultation with all key stakeholders.

Application of the Unit

This unit covers the determination of data needs and collection methods for an organisation or specific plant or process. This will typically be done in liaison with a wide range of people, each of whom will have their own specific information requirements. There will need to be balanced and interpreted into a workable set of data to be collected.

This unit is primarily focused on those decisions which are non-routine and so need specific collection of data, or for those decisions which are routine, the establishment of a routine data collection protocol to allow for the decisions to be made based on appropriate, reliable data.

This unit primarily requires the application of communication and problem solving skills associated with determining information requirements and processes of information collection. Initiative and enterprise, and planning and organising are also required to ensure information targets specific factors. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into the development of processes.

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	Analyse decisions to be made	1.1	Identify personnel to be included in the analysis process
		1.2	Determine the consequences of the decisions in liaison with relevant personnel
		1.3	Determine the variables which can be controlled
		1.4	Determine the variables which cannot be controlled
		1.5	Determine the consequences of a change in these variables in liaison with affected personnel
2	Define factors which cause variables to change	2.1	Identify factors which are able to be controlled
		2.2	Identify factors which are not able to be controlled
		2.3	Identify means of measuring these factors, or indicators for the values of these factors
		2.4	Compile a list of measurements/indicators required.
		2.5	Communicate with team members and involve them in development of factors and changes to ensure awareness and facilitate learning

3	Develop data collection protocols	3.1	Determine methods of making measurements
		3.2	Determine methods of quantifying indicators
		3.3	Determine the benefit/cost of automated (or other) collection of data
4	Develop systems to produce required information	4.1	Identify user of information and their needs and abilities
		4.2	Determine data processing needs to produce required information
		4.3	Determine information distribution channels
		4.4	Determine skill development need for recipients of information
		4.5	Implement systems to produce information
		4.6	Monitor implementation and make adjustments, as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating and negotiating at all levels in the organisation and value stream and with individuals of different levels of literacy and numeracy
- negotiating with employees, suppliers and customers, where necessary, to achieve access to, or collection of, data
- undertaking self-directed problem solving and decision-making on issues of a broad and/or highly specialised nature and in a wide variety of contexts
- developing or sourcing indicators for factors not easily measured
- liaising with stakeholders on acceptable limits for benefits and costs in data collection procedures

Required knowledge

Required knowledge includes:

- business needs of the organisation/section
- information needs of individuals within the organisation
- possible data available/potentially available to the organisation
- methods of collecting available data
- relationship between data available and information required
- methods of converting data into useful information
- methods of developing indicators for factors resistant to measurement

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	A person who demonstrates competency in this unit must be able to provide evidence of their ability to: • determine relevant data, including variables for decisions • determine factors and variables subject to control • develop strategies for data collection that deliver the greatest overall benefit • implement data collection systems.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment.

	Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and

	proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Variables	Variables for this unit are: • measurable inputs, outputs or characteristic of processes or operations that have no fixed quantitative value.
Factors	Factors include: • any variable that is a part of, contributes to, or leads to the quantum of another variable. Ideally factors themselves should be able to be measured. However, in some operations there may be factors that are resistant to objective measurement (e.g. creativity in design, customer colour preferences and life cycles for new products). In these cases indicators for the value of these factors may need to be developed (e.g. through surveys, approximations or experiments)
Decision	A decision may include: • a change, improvement, new/altered process or system which requires data in order to monitor it or

	where data is required to make a decision regarding the selection of alternatives

Unit Sector(s)

Unit sector Competitive systems and practices

Custom Content Section

Not applicable.

MSS405070A Develop and manage sustainable energy practices

Modification History

New unit, superseding MSACMT670A Develop and manage sustainable energy practices - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to identify opportunities for, and make improvements in, sustainable energy practices in an organisation. Areas covered include efficient use of raw materials, management of waste, electricity conservation, heat conservation and management, water management, environment protection and environment obligations of enterprises.

Application of the Unit

This unit applies to an individual who is required to establish systems for improved energy practices in an organisation. The unit involves analysis of energy used in processes and operations and categorising the energy use according to lean principles. The unit covers categorising energy into necessary use and waste with the waste being further categorised into necessary waste and unnecessary waste. Strategies for eliminating or minimising energy waste are covered with benefit/cost analyses being required for strategies.

This unit primarily requires the application of communication and problem solving skills associated with collecting and analysing information. An ability to analyse energy use of technology or processes will be applied. Initiative and enterprise, and planning and organising are also required to develop plans for efficient energy use. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into the development of processes.

Where the quantum of energy used is not easily available or a formal calculation of energy use is required through an energy balancing calculation (e.g. for regulatory purposes) the unit *MSS015011A Conduct a sustainability energy audit* may also be 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	Analyse energy use	1.1	Identify all energy consuming processes
		1.2	Determine quantity and nature of energy consumed
		1.3	Analyse energy consumed and generated in different parts of the process
		1.4	Determine source of energy consumed in process
2	Develop energy conservation plans	2.1	Determine the efficiency of use of energy by all energy consuming processes
		2.2	Determine causes of low efficiency of use
		2.3	Develop plans for increasing the efficiency of energy use
		2.4	Determine benefit/cost of plans
3	Develop energy trading plans	3.1	Compare energy generating activities with energy consuming activities
		3.2	Determine feasibility of energy consuming activities using energy generated by other activities

		3.3	Develop plans for energy trading
		3.4	Determine benefit/cost of plans
4	Investigate alternative sources of energy	4.1	Develop a specification for energy required
		4.2	Identify a range of sources for that energy
		4.3	Determine benefit/cost for alternative energy sources
5	Develop plans for more efficient energy use	5.1	Compare benefit/costs for different alternatives developed
		5.2	Rank proposals based on benefit/cost compare to limited resources
		5.3	Check proposals meet regulatory requirements
		5.4	Recommend proposals for improving energy efficiency
6	Implement selected plans	6.1	Liaise with relevant people to implement energy efficiency plans
		6.2	Follow through to ensure implementation occurs
		6.3	Monitor implementation and make adjustments, as required
		6.4	Check new energy usage to ensure improvements have occurred

Required Skills and Knowledge

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

Required skills

Required skills include:

- using common units, symbols and formulae common in energy-related calculations
- applying mathematics

- communicating with a variety of groups and individuals using different media
- solving complex problems individually and as part of a team
- reviewing range of existing data for suitability and determining where new data gathering is required
- planning and organising complex whole of organisation activities relating to energy use, including objectives, timelines, implementation procedures and monitoring strategy
- determining where energy balancing techniques are required
- accessing manufacturers' data and other sources of energy consumption for individual equipment and processes
- mapping processes and energy flows
- calculating, manipulating and interpreting numerical data
- ranking energy consumption and waste for area, sites or processes
- calculating the efficiency of use of energy by equipment and processes
- consulting with technical and operative staff on possible non-obvious energy wastes
- consulting and negotiating with stakeholders on implementation process for sustainability improvement

Required knowledge

Required knowledge includes:

- types and sources of energy
- methods of analysing energy efficiency for different types of energy
- methods of converting energy values from one form to another
- alternative sources of energy
- principles of energy efficiency
- relevant regulatory/legislative requirements
- energy trading schemes and procedures
- organisation and process needs for energy

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	A person who demonstrates competency in this unit must be able to provide evidence of their ability to: • gather appropriate data to allow energy analyses • categorise energy use into necessary use and waste • develop options for energy reduction including

	presenting of alternatives and benefit/cost analyses • develop strategies and plans for energy use and monitor implementation.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise

	the work organisation, culture, regulatory environment and the industry sector
Waste	Waste (also known as muda in the Toyota Production System and its derivatives) is any activity which does not contribute to customer benefit/features in the product. Within operations, categories of waste include: - excess production and early production - delays - movement and transport - poor process design - inventory - inefficient performance of a process - making defective items - activities which do not yield any benefit to the organisation or any benefit to the organisations customers
Necessary waste	Necessary waste is: any activity or cost which does not contribute directly to customer benefit/feature in the product, and which cannot be avoided (e.g. regulatory compliance and fixed costs). Necessary waste cannot be eliminated but should be managed
Unnecessary waste	Unnecessary waste is: any activity or cost which does not contribute directly to customer benefit/features in the product and can be avoided. Unnecessary waste should be eliminated as quickly as practical
Energy	Energy includes: - all sources of energy used by the process be it electricity, gas or mobile transport fuel The uses of the energy will also be potentially wide and include: - heating and cooling - moving materials (e.g. pumps and conveyors) - modifying materials (e.g. cutting, forming, weaving, knitting, reacting, moulding, extruding and mixing) - generating pressure/vacuum or providing motive power for equipment and transport
Energy trading	Energy trading means both formal trading where the organisation investigates alternatives to:

	- the buying of energy through alternative suppliers and tender processes - selling of excess energy produced by the organisation to energy companies or other producers and - internal trading of excess energy from one area to an energy consuming area elsewhere in the organisation

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405081A Develop a proactive maintenance strategy

Modification History

New unit, superseding MSACMT681A Develop a proactive maintenance strategy - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to develop and implement a proactive maintenance strategy for an organisation. The unit recognises that there are a number of predictive or proactive maintenance strategies, such as total productive maintenance (TPM) and reliability centred maintenance (RCM).

Application of the Unit

This unit applies to an individual responsible for developing a proactive maintenance strategy for an organisation. Typically the organisation will also be implementing other competitive systems and practices. The unit applies to the selection of appropriate strategies, initial development and implementation as well as application of the strategies to new areas and the improvement of operation in existing areas. This would typically be done in a team environment and in consultation with all key stakeholders.

This unit primarily requires the application of skills associated with communication in gathering, analysing and applying information and consulting with stakeholders. Teamwork, problem solving, initiative and enterprise, and planning and organising are required to develop and implement a predictive maintenance strategy. Strategies will incorporate the maintenance requirements of relevant technologies. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into maintenance strategies.

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	Determine appropriate analytical techniques	1.1	Liaise with key stakeholders to determine objectives of maintenance strategy
		1.2	Examine current maintenance situation to determine major areas requiring improvement
		1.3	Compare possible strategies, techniques and tools against organisation needs
		1.4	Select possible strategies, techniques and tools
		1.5	Confirm selected strategies, techniques and tools with key stakeholders
2	Develop reliability strategies	2.1	Select preferred maintenance strategy
		2.2	Examine and adapt strategy to organisation needs and priorities
		2.3	Examine and adapt techniques and tools required to implement strategy
		2.4	Liaise with key stakeholders to develop an implementation plan
		2.5	Identify key information and performance indicators required
3	Implement strategy	3.1	Identify data collection required
		3.2	Identify hardware and other resources required

		3.3	Identify skill needs required in consultation with key stakeholders
		3.4	Ensure all resources/training are available
		3.5	Implement strategy
4	Monitor implementation of strategy	4.1	Compare information/performance indicators with desired levels
		4.2	Liaise with key stakeholders regarding strategy issues
		4.3	Identify areas requiring adjustment
		4.4	Make required adjustments

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with others using a variety of media and techniques
- adapting personal communication strategy to different levels of literacy and numeracy in target individuals and groups
- working in a team
- analysing quantitative and qualitative information to determine proactive maintenance strategy options
- solving problems to root cause
- applying basic arithmetic and statistical techniques
- planning complex strategies, including consideration of timelines, resources, benefit/cost, implementation requirements, and monitoring and adjustment considerations
- reading and interpreting engineering specifications, drawings and charts
- using information system terminals and computers
- prioritising options, including reasons and recommendations
- recording data

Required knowledge

Required knowledge includes:

- characteristics and strengths of different types of strategies, techniques and tools, such as:
 - TPM
 - RCM
 - mean time between failure (MTBF)
 - failure mode effects analysis (FMEA)
 - condition monitoring
 - root cause analysis (RCA)
- holistic costs of different strategies combining cost of maintenance with costs of lost production, sales, and so on, as relevant to the organisation
- business goals sufficient to match the strategy to the business needs
- strategic thinking and its application to proactive maintenance
- principles of process equipment and how to improve its reliability
- resources required and how to obtain them

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	A person who demonstrates competency in this unit must be able to provide evidence of the ability to: • consider a variety of proactive maintenance strategies for suitability to an organisation • consult operators, maintenance, management and other stakeholders in decisions on proactive maintenance strategies • implement selected strategies • monitor performance to selected indicators and make improvements to selected proactive maintenance strategies.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented

	changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning for appropriate portions • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, 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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted so as to take into account: • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
OEE	OEE is the combination of the main factors causing loss of productive capacity from equipment/plant and is: $OEE = \text{availability} \times \text{performance} \times \text{quality rate}$ where: • availability takes into account losses due to breakdown, set-up and adjustments • performance takes into account losses due to minor

	stoppages, reduced speed and idling quality rate takes into account losses due to rejects, reworks and start-up waste
MTBF	MTBF is one key measure of the effectiveness of a maintenance procedure, and is an indicator as to whether root causes are being found and resolved. If MTBF is reducing, then it is an indicator that the maintenance regime is failing. There are many possible causes of any problem. Eliminating some will have no impact, others will ameliorate the problem. However, elimination of the root cause will eliminate the problem. There should only be one root cause for any problem and so the analysis should continue until this one cause is found. Elimination of the root cause permanently eliminates the problem. Depending on the equipment, operations and procedures of the organisation, alternative statistical records of maintenance and maintenance-related events may be substituted for MTBF providing they relate strategies for improving OEE.
FMEA	FMEA is a systematic approach that identifies potential failure modes in a system, product, or operations/assembly operation caused by either design or operations/assembly process deficiencies. It also identifies critical or significant design or process characteristics that require special controls to prevent or detect failure modes. FMEA is a tool used to prevent problems from occurring. Some industry sectors have highly adapted forms of FMEA and may practice traditional FMEA in say their routine maintenance while using another technique, such as Hazard and Operability Studies (HAZOP) for design and modification. HAZOP is a form of FMEA which has been practiced by the process industries for over 30 years and examines the implications of changes in process conditions to process stability.
Condition monitoring	Condition monitoring is used to describe the process of analysing the implications of condition monitoring data for proactive maintenance whether it be obtained from non destructive testing (NDT) reports, visual assessment by experts, diagnostic reports obtained from SCADA or other enterprise or equipment software and product or process quality analyses. It does not require the actual

	undertaking of the NDT or condition monitoring assessment or test. If this is required appropriate units from other Training Packages will be required.

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

PMASUP440B Commission/recommission plant

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the commissioning of new plant/pipeline or the re-commissioning of significantly modified plant/pipeline. This unit does not cover startup of a plant/ pipeline after a shutdown, unless there have been major changes to the plant during the shutdown. For a normal startup use <i>PMAOPS411B Manage plant shutdown and restart</i> .

Application of the Unit

Application of the unit	In a typical scenario, a new plant/pipeline or a major plant/pipeline upgrade is to be commissioned/recommissioned with a leading plant technician taking a significant role. The technician is involved in the design of the plant/plant modifications and the planning of the startup. Being 'involved in' could mean participating in design meetings or HAZOPS or reviewing/checking the design for operability issues or checking the HAZOP outcomes. This does not preclude the inclusion of 'turnkey' type projects, provided the technician has had a role in the plant design, eg checking operability, suitability for local conditions. This competency includes all equipment associated with the new/modified plant. The technician would not normally have a 'hands on' operating role for all items of equipment, but may have a 'hands on' role for major items of equipment. More importantly, the technician will have an overall role and would be expected to have an understanding of the function of all items of equipment in the plant so that detailed directions can be given plant operators who are performing the 'hands on' role during the commissioning/recommissioning. This competency is typically performed by experienced technicians, likely to be the leaders of an operational team. This may include working in conjunction with a design team, or reviewing final design to ensure plant/ pipeline meets operational requirements and for the purpose of commissioning or recommissioning plant/pipelines. As commissioning is usually a team activity, the technician will take a lead technical role, rather than undertake all aspects on an individual basis.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Contribute to/review the design of plant/ equipment.	1.1. Apply process understanding to the design process 1.2. Identify the role and purpose of the plant and equipment 1.3. Ensure design meets the identified need 1.4. Identify process conditions and apply to hazard and operability studies 1.5. Undertake investigations following hazard studies 1.6. Record and report findings.
2. Take part in commissioning planning.	2.1. Ensure the work is coordinated effectively with others involved on the work site 2.2. Obtain materials necessary to complete the work and check against job requirements

ELEMENT	PERFORMANCE CRITERIA
	2.3. Obtain tools and equipment necessary to carry out the work and check for correct operation and safety 2.4. Prepare plans to ensure that procedures are performed in the correct sequence 2.5. Obtain approvals where necessary from appropriate authorities.
3. Participate in acceptance of plant/ equipment.	3.1. Undertake pre-commissioning activities 3.2. Complete safety acceptance documentation 3.3. Identify, record and report problems or non-conformance 3.4. Conduct trials/test runs 3.5. Record and report performance data.
4. Commission system.	4.1. Bring the plant/plant systems/pipeline on line 4.2. Make and report adjustments 4.3. Prepare reports in accordance with legislative and company requirements to maintain the historical record.
5. Evaluate results and identify modifications.	5.1. Identify modifications and improvements required 5.2. Check specifications, procedures and training material match the final system/procedures 5.3. Complete documentation and report to appropriate personnel.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
- hazard analysis - completing plant records - communication - problem solving.
Required knowledge
Competence to include the ability to apply and explain: HAZOP (or similar) study process and the interpretation of findings

REQUIRED SKILLS AND KNOWLEDGE

- results and impact of a HAZAN (or similar) study
- the process of hazard identification, risk assessment and control
- hierarchy of control
- sources of hazard information (such as Material Safety Data Sheets)
- principles of operation of equipment
- interpretation of design drawings, schematics and manuals
- physics and chemistry relevant to the plant and the materials processed or produced
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- expected problems, faults and their resolution
- possible alarms and actions
- any known or expected plant process idiosyncrasies
- all items on a schematic of the plant and the function of each
- correct methods of starting, stopping, operating and controlling process
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems to be expected
- principles of operation of instrumentation
- principles of basic control systems
- distinguish between the following problem sources, and their avoidance:
 - chemical
 - instrument
 - equipment (electrical/mechanical)
 - maintenance.

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, the Range Statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Simulation may be required to allow for assessment

EVIDENCE GUIDE

	of parts of this unit. It is possible that a simulation will be required to ensure that the technician is competent before taking a significant role in a commissioning activity. Commissioning is an infrequent and often frenetic activity and so it may not be practical or equitable to wait for an actual commissioning to occur to use this as the basis for assessment. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/ scenarios and role plays. This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk-throughs of abnormal operations) and off the plant.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • potential problems are recognised • the range of possible causes can be identified and analysed and the most likely cause determined • appropriate action is taken to ensure commissioning stays on schedule • obvious problems in related plant areas are recognised and an appropriate contribution made to their solution. These aspects may be best assessed using a range of scenarios/case studies/what-ifs as the stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

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Context of and specific resources for assessment	Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. In a major hazard facility, it may be appropriate to assess this unit concurrently with relevant OHS units.
Guidance information for assessment	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**

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.

Appropriate authorities	Appropriate authorities may include: • local councils • road authority • sewerage and stormwater authorities • providers of services such as electricity, water and telephones.
Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Plant	Plant covers on or off shore plant, well heads and also transmission pipelines or similar.

RANGE STATEMENT	
Commissioning	Commissioning refers to the start-up of a new plant or plant unit and the associated equipment for the first time.
Commissioning/re-commissioning activities	Commissioning/recommissioning activities may include: • trial running of equipment • use of trial materials in plant • safe introduction of process materials to plant • producing product within specification • bringing plant to design rates • solving operational problems • disposal of waste generated in the start-up.
Documentation	Documentation may include: • operating procedures • OHS and environmental legislative requirements • manufacturer specifications • appropriate authority approvals • quality assurance inspection and test reports.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.
Plant/pipeline systems	Plant/pipeline systems may include: • pipes • valves • operating units • electrical and electronic components • PLCs/DCS control (programmable logic controllers, distributed control systems) or other plant controls • cathodic protection • pressure/flow/temperature etc regulation and meters.
Pre-commissioning	Pre-commissioning activities may include: • checking plant is built to design • ensuring plant is safe to operate

RANGE STATEMENT	
	• ensuring plant area is clean and clear of debris • ensuring the plant internals are clean and clear of debris • functional checking of equipment and ancillaries.
Procedures	All operations are performed in accordance with standard operating procedures. Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Responsible Care) and government regulations.
Recommissioning	Recommissioning refers to the start-up of an existing plant following major modifications, rebuild or reconfiguration. This competency unit includes functions such as : • liaison with relevant personnel such as manufacturers, engineering personnel, designers, contractors and maintenance and other company personnel • participation in/reviewing of hazard studies, which may include: • hazard and operability studies (HAZOP) • hazard analysis studies (HAZAN) • participation in/reviewing of design or modification plans
Tools, materials and equipment	Tools, materials and equipment may include: • hand tools, including power operated • other power operated tools • plant • emergency equipment • electrical and electronic test equipment

RANGE STATEMENT

- gas detectors
- air compressor
- water pump.

Unit Sector(s)

Unit sector	Support/generic

Competency field

Competency field	

Co-requisite units

Co-requisite units		